

Section 309

Assessment and Strategy
2011-2015

Guam Coastal Management Program
Bureau of Statistics and Plans

September 2010

DRAFT



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Guam Coastal Management Program

Section 309

Assessments and Strategy

Section 309 of the Coastal Zone Management Act (CZMA), as amended, encourages states and territories to develop program changes in one or more of nine coastal zone enhancement areas through a coastal zone enhancement grant program. Rather than just changes to the manner that states and territories implement programs, the changes are made to federally approved CZM programs. These changes may include updates or revisions to state and territory enforceable policies and authorities. Such changes include the following activities that will enhance a state or territory's ability to achieve one or more of the coastal zone enhancement objectives:

1. A change to coastal zone boundaries;
2. New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;
3. New or revised local coastal programs and implementing ordinances;
4. New or revised coastal land acquisition, management, and restoration programs;
5. New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
6. New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management.

Introduction

Located in the central western Pacific, Guam is a small raised limestone and volcanic island of just 212 square miles, with extensive coasts and a long tradition of active use of coastal resources. The Guam Coastal Management Program, or GCMP, works with a network of partners to manage coastal areas, including a rich coral reef system, an active recreational and subsistence fishery and numerous other resources.

GCMP previously completed assessment and strategy documents in 1991, 1997, 2001 and 2006. Though changing conditions on island warranted some priority changes and numerous updates to 309 efforts, this 2010 update reflects changes that are all based on the single biggest event to happen on Guam since World War II. The massive Department of Defense buildup presents many economic opportunities for the community, but these opportunities are paired with daunting challenges, especially in the protection and enhancement of the island's limited, fragile natural resources.

Although military officials announced the buildup at the time of the 2006 assessment, the details and scope of this enormous development have only recently been made more clear. Even now, after the Record of Decision has been signed, the full extent of the projects to accommodate 8,000 Marines, their dependents, and additional defense personnel are not fully understood. As such, GCMP's 2010 assessment reflects both the uncertainty of the immediate future and the need to prioritize 309 efforts to match the major concerns that will be associated with the rapid, immense scale of the buildup activities. This work also reflects concerns that arise due to the local government and private sector development that is already ongoing in anticipation of both the military buildup and the increase in population due to this activity.

Balancing the rapid, large scale development of the military buildup, Guam continues to focus on conservation efforts that have recently been enhanced by new regional partnerships and a growing public awareness of not only the unique nature of the island's environment, but the need for personal responsibility to conserve it. In 2006, Governor Felix Camacho joined the leaders of the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia and the Republics of the Marshall Islands and Palau in committing to the Micronesia Challenge.

The Challenge is an initiative calling for effective conservation of 20 percent of terrestrial and 30 percent of near shore resources by 2020. Since its creation, the MC has grown to include some endowment funding and an active network of conservation managers and policy specialists working to meet these goals. As a framework for Guam's various ongoing resource management and conservation efforts, this initiative has helped focus efforts on effective conservation and the need for reasonable monitoring mechanisms to document progress and guide strategy development.

The Challenge, new public interest in resource protection, and the buildup will guide GCMP activities during the next few years. The scale of the Department of Defense initiative and the potential coastal zone impacts that may result from this move are unprecedented in non-war time conditions. Given Guam's small size, unique and fragile environment, and the catalog of existing threats to effect conservation, the buildup activity must be closely and carefully monitored to minimize harmful effects to the environment and Guam's civilian community. Whenever possible, new policies and regulations must be developed to anticipated potential problems, ranging from an increase in invasive species to overharvest problems caused by a sudden influx of new workers from areas with different environments and environmental ethics. As such, the GCMP assessment is focused on the following three high priority areas: Cumulative and Secondary Impacts, Energy and Government Facility Siting, and Public Access. A fourth high priority area is Coastal Hazards, due to increasing concerns about climate change impacts and Guam's vulnerability to seismic, storm and other hazards.

This 2010 update provides an opportunity to review the program's accomplishments as well as its strategy for handling new challenges and changing scenarios facing Guam. The new tasks should improve GCMP's ability to help protect the island's fragile environment, which is under new and growing pressure based on rapid large scale development. Most of our priorities remain unchanged, but there will be numerous adjustments to meet current demands and pressures. Just as past assessments have highlighted continuing growth and development, this assessment will

note significant upcoming events and the general concern with cumulative and secondary impacts as projects occur.

Natural disasters, always a concern for a small island in the Western Pacific's "Typhoon Alley," remain an issue for Guam. New challenges will be associated with climate change impacts, an issue facing communities around the globe.

In light of the proposed and ongoing development activity, Guam's highest priority items are priority coastal hazards, energy and government facility siting, public access and cumulative and secondary impacts. The three medium priority areas are wetlands, marine debris, special area management plans and ocean resources. Lastly, aquaculture remains a low priority area for Guam, based on the urgent needs associated with the other areas.

Government facility siting has been elevated to high priority due to major increases in both federal and local government construction activities. In addition to the new facilities that will be built to house the influx of new military personnel, their dependents, and associated support staff, the local government is working through major developments including the construction of the new landfill, the closure of the old dump, upgrades to water, power and transportation infrastructure and other projects. This rapid and large scale construction has elevated the priority for both government siting and special area management, because of potential impacts on such regions as the northern aquifer recharge area.

In anticipation of changes that will result from the buildup, an increase in existing issues and a lack of resolution to some past concerns, public access also has been elevated to high priority. The buildup includes both terrestrial and coastal areas that will see some use restrictions due to proposed activities such as a firing range. The loss of use at some of these areas, and increasing development outside federal or local properties, will only further compress access that many recreational or subsistence users already are concerned about. The new status will allow GCMP to focus efforts on this important community concern.

Areas for improvement (issues) are identified through an assessment of issue areas and a strategy for improvement.

II. Summary of Completed Section 309 Efforts

Setting the background for the upcoming period of rapid changes, GCMP has completed or initiated the following programs. These activities were developed in response to past assessments, including the most recent 2006 document.

1. Natural Resources Strategy

Natural Resources Subcommittee (NRS) of the Civilian Military Task Force is tasked with formulating a strategy to manage natural resources for sustainability through this period of growth, thereby ensuring the viability of natural resources for future generations. The NRS has oversight responsibility for coral reef ecosystems and associated biological communities,

terrestrial ecosystems, cultural and archaeological resources, invasive species, watershed ecosystems, migratory birds, wildlife, endangered species and their habitats, protected species, marine mammals, direct, cumulative, and secondary impacts to the natural environment, oversight and participation in the Department of Defense (DOD) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS, hereinafter EIS) process, and required mitigation plans for the loss of natural resources resulting from construction associated with all development.

The Strategy was completed in 2008 and have been used to provide direction for the natural resources subcommittee as we address critical issues related to the military buildup.

2. Mitigation Policy for Development

Mitigation measures and compensation are required for resource loss due to development. The development of a mitigation strategy will assist the Government of Guam by having a better understanding of the cumulative loss of its valuable natural resources as a result of necessary development. The plan attempts to create the “big picture” and be more prepared for request for development in sensitive areas that ultimately will compromise the islands natural resources. This plan will assist the Government in identifying appropriate mitigation projects.

This plan will assist the Government in identifying appropriate mitigation projects and provide critical historic information about previous mitigation attempts. The plan will review previous mitigation projects and the effectiveness of those efforts. It will assess if these agreements for these projects have been achieved. A consultant was hired to complete the plan. Public hearings were conducted and changes were made. The plan was approved by the Governor and was submitted to the Guam Legislature for adoption. It is expected that Policy will be adopted by December 2010.

3. Mitigation Banking

The Natural Resources Subcommittee of the Governor’s Civilian/Military Task Force is responsible for ensuring natural resources are protected as a result of expanded public and private development as a result of the Department of Defense activities and military deployment of troops from the region to the island. Mitigation Banking was identified as a possible measure in the Compensatory Mitigation Policy (CMP). The CMP will be applied to any development on federal, government of Guam and private properties on Guam. This effort will not only address losses in the marine environment, but for the terrestrial and historic resources as well.

A consultant will be hired in 2010 and expect to be completed by 2011.

4. Updated of the Northern and Central Land Use Plan

The purpose of this project is to provide a guide for future development of northern and central Guam while protecting Guam’s unique culture and natural resources. The land use plan is intended to serve as a guide for future development and support community views regarding development, conservation and need for open space.

The Plan will cover the period from 2008 to 2025 and will address the affected areas of central and north Guam, which will be subject to the greatest growth pressures resulting from the planned military buildup as well as increased private development.

The major driver of the plan was to ensure that development will be conducted in a sustainable way that protects Guam natural resources and the sole source aquifer.

A consultant was hired to complete the plan. Various public meeting were held. The Plan was approved by the Governor and was submitted to the Guam Legislature for adoption. It is expected that the policy will be adopted by December 2010.

5. Conservation/Development Suitability Analysis Utilizing GIS and Green Infrastructure projects.

Conduct an analysis utilizing Geographic Information Systems (GIS) and Green Infrastructure Concepts to strategically determine areas on Guam where conservation of natural resource areas or land development should ideally occur. The primary consideration here should be to strategically conserve our limited natural resource areas while identifying those areas that are more suitable for development.

The results of the analysis will be utilized to help guide policy in preserving natural resources areas while allowing for more development in other areas. Presently there the local conservation areas are very limited and the laws that may protect them may not be adequate to do so in the face of shrinking land and their associated natural resources.

With the impending Military Buildup and the associated development of areas previously undeveloped there is a need to determine what land areas should be conserved and what can be developed without destroying or degrading those limited natural resources. There have been data layers developed in GIS recently that makes this type of analysis possible. Some of this recent GIS data development was spurred by the potential changes from a planned Military Buildup, proposed availability of satellite imagery and the need to classify land cover and vegetation types for various reasons. It is now possible to conduct this analysis project.

The analysis, utilizing primarily existing Geographic Information Systems (GIS) data layers, should identify and classify land areas where there are natural hazards and manmade constraints to development and natural resources areas such as limestone forests, wetlands, streams, farmlands and parks. Utilizing Green Infrastructure concepts, efforts should be made to identify high quality natural resources hubs and cores. The analysis will then determine whether these areas can benefit from further protection. Such protection can consist of wider buffers, linking with other hubs or cores to create more viable conservation areas and appropriate land use zoning.

6. The Recreational Water Use Master Plan- This project was funded with 309 funds. \$38,000 funds. The updated plan was completed in 2010. The RWUMP made recommendation of rules and regulations and updated laws that address impacts to coral reef resources resulting from

recreational activity and the increase populations. Information from the updated plan will be presented the Department of Parks and Recreation to draft proposed legislation that will address gaps in the existing legislation.

7. *Guam Seashore Reserve Plan* (formally known as the Territorial Seashore Reserve Plan). Although this effort was originally developed with \$91,000 in 309 funds in 2006 through a contract with a private consultant, the final draft was completed by the Seashore Reserve Task Force, composed of GCMP and its network agencies. The Guam Seashore Reserve Plan remains a high priority for this 309 Assessment. Moreover, its implementation will work to protect and manage the seashore's valuable resource and ensure our island's beaches and reefs are protected for the enjoyment of current and succeeding generations. Stakeholder meetings and public outreach efforts have been conducted. The Plan is in its final stages of completion. Although much energy has been invested in the adoption of the Plan, we have not been able to move the plan forward toward approval from the Seashore Commission. Although members are very supportive of the Plan, other priorities have delayed the adoption of the Plan.

Wetlands

Section 309 Enhancement Objective

Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Please indicate the extent, status, and trends of wetlands in the coastal zone using the following table:

Wetlands type	Estimated historic extent (acres)	Current extent (acres)	Trends in acres lost since 2006 (Net acres gained & lost)	Acres gained through voluntary mechanisms since 2006	Acres gained through mitigation since 2006	Year and source(s) of Data
Tidal (Great Lakes) vegetated	10,431 1975		No significant change			
Tidal (Great Lakes) non-vegetated						
Non-tidal/freshwater	4,055 1975		No significant change			
Other (please specify)	0		No significant change			

2. 2) If information is not available to fill in the above table, provide a qualitative description of information requested, including wetlands status and trends, based on the best available information.

Overall, Guam is working on creating a more holistic approach to environmental protection and specifically to watershed management. GCMP closely collaborates with other agencies including the Guam Environmental Protection Agency and the Guam Department of Agriculture to carry out these efforts, including projects to protect and enhance the island's wetland areas. Mapping projects, assessment of existing resources and some monitoring efforts are all ongoing activities.

Regarding trends and threats, wetland areas are under constant pressure due to the island's small size. With a landmass of only about 212 square miles and a growing population estimated at about 173,000 in 2009, Guam faces the loss of many natural areas due to growing community needs. Approximately one-third of the island is under federal control, a number that will likely increase as the military buildup occurs. After considering steep slope areas that are not developable, narrow coasts subject to frequent storm surge and wave inundation, and tracts of local government property, the inventory of developable land is quite small and wetlands are vulnerable to development just due to the island's small size.

According to estimates made from the USFWS National Wetland Inventory mapping project for Guam, issued in 1983, Guam's wetland resources covered by this Plan total approximately 5,000 acres. This acreage equals slightly less than four percent of the island's total land area. Government of Guam development within wetlands, or on lands which affect wetlands, is limited to projects where no practicable alternative has existed; these projects typically include road and other utility crossings and the location of infrastructure such as sewer pump stations which must be located in low areas within the surrounding topography.

The Guam Wetland Rules and Regulations, (as amended by Executive Order 90-13, state that the 1983 National Wetland Inventory (NWI) Map is the official wetland map for Guam until such a time that a study is completed. Presently, the NWI map for Guam is the official map. Areas under jurisdiction of the Rules and Regulations include all Government of Guam and private lands on Guam. Land under federal jurisdiction is not governed by the Guam rules and regulations, though still subject to all U.S. Army Corps of Engineers (USACE) Section 404 provisions. Compliance with the Guam rules and regulations shall precede application for permits from the USACE.. Issuance of a permit for development by the Guam Land Use Commission does not preclude the USACE from denying an application under Sec. 404.

Guam's community, the public and the regulators must have an opportunity to correct past mistakes and plan for more orderly development in the future. Sustainable use of controlled wetland resources can be achieved through preservation of most high value wetland and although some may be lost to developments, they should be mitigated. Wetland that were impacted and degraded can be restored to regain its functions at its original site or mitigated elsewhere for the permitted activity. Wetland protection can be enhanced through cooperative efforts among regulatory agencies and other Federal/ Government of Guam Agencies.

Although development pressure around Guam continues to be high, there has not been a recent effort to update wetland maps for terrestrial or marine areas. However, application reviews for projects during this assessment period included limited wetland impact issues.

3. 3) Provide a brief explanation for trends.

Resource managers are under pressure to balance the need for conservation and community needs, a fact that will continue to be emphasized as the military buildup and accompanying economic surges happen in the next three to five years. Because of the significant development within the Port Authority of Guam and Navy base properties in southern Guam, some of the island's mangroves will undoubtedly be affected by at least indirect and secondary impacts if not more direct impacts from the development. GCMP and partner agencies will carefully monitor

the design and permit phases, as well as actual construction work, to attempt to avoid as many impacts as possible, provide adequate mitigation where necessary and monitor the implementation of these programs.

The Government of Guam is under a U.S. court order to build a new sanitary landfill and close the Ordot dump. This order requires the Government of Guam to end discharge from the Ordot Dump into Lonfit River. The Government of Guam is in the process of closing the old dump and opening a new municipal solid waste landfill facility in Dandan, Inarajan for the new Landfill located in southern Guam was the site selected for the facility and is slated to open in 2011.

Because of Guam's size and geology, there is very limited alternative in siting of new landfill facility where wetlands will be affected. The landfill is not appropriate to be built over porous limestone soils, which has potential threat to the Guam's Sole Source Aquifer, which provides much of the islands' drinking water. Development activities and siting of projects in upland areas, as well as, construction on erodible soils, poor construction practices affects.

This pressure is expected to increase as military buildup projects break ground in the next few years, but regulatory controls through local statutes and U.S. Army Corps of Engineer requirements will apply: private and government of Guam lands are subject to Guam Wetland Rules and Regulations, while federal properties are subject to USACE Section 404 provisions. Even in cases where local permits and land use permission are granted, the USACE may deny an application under Section 404.

In addition to standard permitting processes, Guam continues to work on a more holistic approach to environmental protection and specifically to watershed management, which has significant impacts on wetland areas. GCMP closely collaborates with other agencies including the Guam Environmental Protection Agency and the Guam Department of Agriculture to carry out these efforts, including projects to protect and enhance the island's wetland areas. Mapping projects, assessment of existing resources and some monitoring efforts are all ongoing activities.

Erosion: Erosion continues to be a significant problem for southern Guam, where development, storms and wildfires remove native forest vegetation and expose highly erodible clay soils. As native species are virtually unable to grow on the bare clay soils, these barren areas have dramatically increased sediment loads in southern rivers and streams, leading to major damage on receiving coral reefs. The problem extends beyond environmental concerns, as a freshwater retention dam providing water to much of southern Guam has periods of reduced function due to sediment accumulation.

Past reforestation efforts have focused on planting projects, using nitrogen-fixing species such as acacia to augment the soil in preparation for additional planting of native vegetation. However, many of these areas continued to experience fires and other disturbances, so large numbers of the more than 1 million trees planted in four watersheds were lost.

GCMP partners with the Guam Department of Agriculture, USDA's NRCS, southern communities and various local organizations to change the pattern of replanting and destruction. New projects include greater volunteer participation, outreach activities, and a campaign to

address the wildfires that have been such a significant contribution to the erosion problem for many years. A 2010 public law will increase penalties for anyone throwing lit cigarettes from cars during periods of high fire risk.

To address another cause of wildfires – hunters who intentionally set blazes to draw out deer – GCMP staff is working on a long-term campaign to change raise awareness and change public behavior with regard to destructive hunting practices. The new approach includes many family-friendly activities to promote environmental health, recreational opportunities and educational material to highlight the need to protect wetlands and coasts.

Pollution/NPS: Various enforcement policies and measures remain in place to satisfy the intent and objectives of this management measure, and local agencies continue to update regulations and policies to meet changing conditions and incorporate newer technology and information. Guam also updated its pesticide statutes for the first time in more than 30 years, passing updates to the pesticide codes in Public Law 29-26 in October 2007 and adopting new rules and regulations for pesticides in September 2010, via Public Law 30-197.

4. 4) Identify ongoing or planned efforts to develop monitoring programs or quantitative measures for this enhancement area.

GEPA is responsible for the monitoring and evaluation of wetlands. GCMP and other agencies as members of the Wetland Task Force will provide input and review of evaluation report and make recommendations for specific project area, based on set methodology for implementation.

5. 5) Use the following table to characterize direct and indirect threats to coastal wetlands, both natural and man-made. If necessary, additional narrative can be provided below to describe threats.

Type of threat	Severity of impacts (H,M,L)	Geographic scope of impacts (extensive or limited)	Irreversibility (H,M,L)
Development/Fill	High	L	H
Alteration of hydrology	High	L	H
Erosion	High	E	M
Pollution	High	E	M
Channelization	High	L	M
Nuisance or exotic species	High	E	H
Freshwater input	High	L	M
Sea level rise/Great Lake level change	High	E	H
Other (please specify)			L

The existing Guam Wetland Rules and Regulations are outdated, drafted in 1978 and do not provide specific requirements and guidance on mitigation which must also be based on scientific knowledge or public benefit.

6. **(CM)** Indicate whether the Coastal Management Program (CMP) has a mapped inventory of the following habitat types in the coastal zone and the approximate time since it was developed or significantly updated

Habitat type	CMP has mapped inventory (Y or N)	Date completed or substantially updated
Tidal (Great Lakes) Wetlands	Y	2006
Beach	Y	2006
Near shore	Y	2006
Other (please specify)	Y (Imagery)	2009

Note: Raster Data for land covers and vegetations was done in 2002 and revised in 2005
Land Cover classification was made on 2006 and the imagery was done on 2009 prepared in conjunction with NOAA Services.

7. **(CM)** Use the table below to report information related coastal habitat restoration and protection. The purpose of this contextual measure is to describe trends in the restoration and protection of coastal habitat conducted by the State using non-CZM funds or non Coastal and Estuarine Land Conservation Program (CELCP) funds. If data is not available to report for this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.

Contextual measure	Cumulative acres for 2004-2010
Number of acres of coastal habitat restored using non-CZM or non-Coastal and Estuarine Land Conservation Program (CELCP) funds	Cetti bay and Masso Mitigation Project with DOD
Number of acres of coastal habitat protected through acquisition or easement using non-CZM or non-CELCP funds	0 – GCMP has not received any CELP funds.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the wetland management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Wetland regulatory program implementation, policies, and standards	Y	N
Wetland protection policies and standards	Y	N
Wetland assessment methodologies (health, function, extent)	Y	N
Wetland restoration or enhancement programs	Y	N
Wetland policies related public infrastructure funding	Y	N
Wetland mitigation programs and policies	Y	N
Wetland creation programs and policies	Y	N
Wetland acquisition programs	Y	N
Wetland mapping, GIS, and tracking systems	Y	N
Special Area Management Plans	Y	N
Wetland research and monitoring	Y	N
Wetland education and outreach	Y	N
Other (please specify)	Y	N

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.
 - a) Characterize significant changes since the last assessment;
 - b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
 - c) Characterize the outcomes and effectiveness of the changes.

An on-going wetlands identification program is proposed for Guam. This program should determine the baseline data for known wetlands, and should provide a framework to catalogue newly recognized wetlands, once they come to the attention of regulatory or resource agencies. The data generated in the identification program must be current, readily available, and retrievable. The GEPA's "Draft Guam Wetland Conservation Plan is created to promote the national wetland goal of *"No Net Loss"* of the important values and functions of Guam's wetland resources. Current regulatory efforts for protecting and managing wetlands on Guam are somewhat fragmented. Regulatory control of wetland impacts is generally achieved indirectly or coincidentally through the various water regulatory programs under the Clean Water Act, or through conservation programs under the Endangered Species Act. In order to focus regulatory

and resource agency efforts for wetland protection, this Plan is created as a wetland-specific guide to wetland conservation. The Plan also aims to promote wetlands conservation through an integrated program of education and training for the public and professional community, to raise awareness of the need to protect wetlands.”

3. **(CM)** Indicate whether the CMP has a habitat restoration plan for the following coastal habitats and the approximate time since the plan was developed or significantly updated.

Habitat type	CMP has a restoration plan (Y or N)	Date completed or substantially updated
Tidal (Great Lake) Wetlands	N	
Beach and Dune	N	
Near shore	Y- limited areas	2009
Other (please specify)		

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the Coastal Management Program and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Select type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H, M, L)
No net loss of wetland functions and values	Recommend for revisions of existing laws and regulations, Need for effective enforcement capability	M
Gaps in regulatory reviews, overlaps with other GovGuam agencies.	Improving efficiency of the regulatory process to improve wetland protection efforts	M
Education and public outreach	Increase the public's appreciation of the valuable functions of wetlands	M

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High _____
Medium x

Low _____

Briefly explain the level of priority given for this enhancement area.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes _____

No _____x_____

Briefly explain why a strategy will or will not be developed for this enhancement area.

On Guam, activities affecting wetlands are regulated by both the United States Federal Government and the Government of Guam. The existing GEPA's Draft Guam Wetland Conservation Plan already describes the Guam and Federal programs. It identifies and evaluate areas of program overlap, areas where the two programs may conflict, and explore the dual role of some Government of Guam programs which are tasked with administering Federal programs. However, in terms of wetland regulations, Federal law supersedes Guam law. Guam's assumption of the Guam Coastal Zone Management Program and the Guam "401 Water Quality Certification" program are critically important in giving local control over development affecting wetlands. In addition to federal wetland programs, Guam has developed its own set of laws regulating development and other activities in wetlands.

Coastal Hazards

Section 309 Enhancement Objective

Prevent or significantly reduce threats to life and property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level change

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Characterize the level of risk in the coastal zone from the following coastal hazards:

(Risk is defined as: “the estimated impact that a hazard would have on people, services, facilities and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage.” *Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA 386-2. August 2001*)

Type of hazard	General level of risk (H,M,L)	Geographic Scope of Risk (Coast-wide, Sub-region)
Flooding	H	Territory-wide
Coastal storms, including associated storm surge	H	Territory-wide
Geological hazards (e.g., tsunamis, earthquakes)	H	Territory-wide
Shoreline erosion (including bluff and dune erosion)	H	Territory-wide
Sea level rise and other climate change impacts	M	Territory-wide
Great Lake level change and other climate change impacts		
Land subsidence	L	Territory-wide
Other (please specify)		

2. For hazards identified as a high level of risk, please explain why it is considered a high level risk. For example, has a risk assessment been conducted, either through the State or Territory Hazard Mitigation Plan or elsewhere?

Guam has the highest probability of being subject to a tropical cyclone of any U.S. jurisdiction. Along with the risk of typhoons and the wind, heavy rain and storm surge events associated with these storms, Guam is in an extremely seismically active area and is subject to geologic and seismic hazards as well. Because of the long history of disaster activations and emergency management efforts, the island has a great deal of information regarding the risks continues to assess changing conditions that may exacerbate risk.

Shoreline Erosion: Recently, the Army Corps of Engineers developed a “coastal erosion study” for Guam.

Conservation/Development Suitability Analysis Utilizing GIS and Green Infrastructure

Conduct an analysis utilizing Geographic Information Systems (GIS) and Green Infrastructure Concepts to strategically determine areas on Guam where conservation of natural resource areas or land development should ideally occur. The primary consideration here should be to strategically conserve our limited natural resource areas while identifying those areas that are more suitable for development.

The results of the analysis will be utilized to help guide policy in preserving natural resources areas while allowing for more development in other areas. Presently there the local conservation areas are very limited and the laws that may protect them may not be adequate to do so in the face of shrinking land and their associated natural resources.

3. If the level of risk or state of knowledge of risk for any of these hazards has changed since the last assessment, please explain.

Since the first Guam Hazard Mitigation Plan was approved in 2005, there has been an additional approved update in 2008 and the Guam Office of Homeland Security is in the process of updating the plan for 2011. In addition, the Army Corps of Engineers recently developed a coastal erosion study for Guam, and information about coastal hazards in general continues to be a focus of local and federal efforts.

4. Identify any ongoing or planned efforts to develop quantitative measures of risk for these hazards.

Shoreline Setback Analysis: There are planned efforts that will involve conducting shoreline setback analysis to determine appropriate setbacks along the shoreline based on what current conditions would result in the event of a Tsunami, Typhoon or Storm Waves and Surges and flooding.

Tsunami Study: There are planned efforts to develop a Tsunami Inundation Study for Guam. This will involve utilizing the LIDAR data of the island that was acquired by the government of Guam. The studies are targeted at the three most populated areas on island. The hope is that the current and future studies can be utilized in supporting efforts to change setback legislation.

Climate change: Guam has been actively engaged in climate change adaptation planning and development. As part of this process, which frequently involves regional partners with similar concerns and risks, the island works through various risk scenarios. GCMP will continue to partner with regional and national organizations to further characterize the new risks associated with climate change.

5. **(CM)** Use the table below to identify the number of communities in the coastal zone that have a mapped inventory of areas affected by the following coastal hazards. If data is not

available to report for this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.

Type of hazard	Number of communities that have a mapped inventory	Date completed or substantially updated
Flooding	19 villages	2007
Storm surge	19 villages	
Geological hazards (including Earthquakes, tsunamis)	19 villages	2009
Shoreline erosion (including bluff and dune erosion)	5 villages	2008
Sea level rise	0	
Great lake level fluctuation	0	
Land subsidence	0	
Other (please specify)		

Maps of hazard areas and risk (for wind hazards, surge, flooding, tsunamis, etc.) have been prepared through a variety of technical reports from the University of Guam and its various programs, as well as through the Federal Emergency Management Agency and consultants working with Guam on disaster response, recovery and mitigation work, including the latest updates to the Guam Hazard Mitigation Plan. The 2008 plan contains a variety of mapping tools and the 2011 update will likely feature changes reflecting new information that may have occurred since the development of the existing maps.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Building setbacks/ restrictions	Y	N
Methodologies for determining setbacks	Y	N
Repair/rebuilding restrictions	Y	Y
Restriction of hard shoreline protection structures	Y	Y
Promotion of alternative shoreline stabilization methodologies	Y	Y
Renovation of shoreline protection structures	Y	Y
Beach/dune protection (other than setbacks)	Y	N

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Permit compliance	Y	Y
Sediment management plans	Y	Y
Repetitive flood loss policies, (e.g., relocation, buyouts)	Y	N
Local hazards mitigation planning	Y	N
Local post-disaster redevelopment plans	N	N
Real estate sales disclosure requirements	N	N
Restrictions on publicly funded infrastructure	Y	N
Climate change planning and adaptation strategies	Y	N
Special Area Management Plans	Y	Y
Hazards research and monitoring	Y	N
Hazards education and outreach	Y	Y
Other (please specify)		

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.
 - a) Characterize significant changes since the last assessment;
 - b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
 - c) Characterize the outcomes and effectiveness of the changes.

Building restrictions

Guam recently adopted new building code updates, which were enacted into Public Law 30-84 in February 2010. The new codes include standards to reduce hazard damage across many categories, but there are currently discussions about needed revisions to the update to account for some unique local conditions. The process continues to evolve but it is clear that the government and industry are committed to resolving the issues and adopting measures that will be incorporate new options for buildings while enhancing public safety. These efforts are largely funded under different local and federal programs rather than through GCMP funding, but the coastal management office continues to play a major role in application review, permitting procedures and development of new policies and programs.

The North and Central Guam Land Use Plan, discussed in greater detail under the Special Area Management enhancement area, was developed through 309 support. The plan only recently finished a series of public hearings and will have impacts on efforts to prevent damages or injuries associated with coastal hazards. The new land use plan also addresses restrictions and limitations on new building sites to mitigate against future hazard damage.

The Guam Compensatory Mitigation Policy, discussed under the Cumulative & Secondary Impacts enhancement area, is a recently completed 309 project. The effectiveness of the policy will be tested as the island works through the development process for the military buildup and other upcoming projects.

Climate change planning and adaptation strategies

Guam has been actively engaged in climate change adaptation planning and development. As part of this process, which frequently involves regional partners with similar concerns and risks, the island works through various risk scenarios. GCMP will continue to partner with regional and national organizations to further characterize the new risks associated with climate change. These efforts are funded by a range of sources, but include significant support from Coral Reef Initiative monies as well as coastal management funding.

Hazard education and outreach

Hazards education and outreach activities since the last assessment, conducted through the Guam Homeland Security Office and its federal counterparts:

- Tsunami evacuation routes have been created, marked with signage and promoted in a public outreach campaign.
- GHS/OCD is promoting more drills for seismic events in schools and the community.

3. **(CM)** Use the appropriate table below to report the number of communities in the coastal zone that use setbacks, buffers, or land use policies to direct development away from areas vulnerable to coastal hazards. If data is not available to report for this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.

For CMPs that use numerically based setback or buffers to direct development away from hazardous areas report the following:

Contextual measure	Number of communities
Number of communities in the coastal zone required by state law or policy to implement setbacks, buffers, or other land use policies to direct develop away from hazardous areas.	19 villages
Number of communities in the coastal zone that have setback, buffer, or other land use policies to direct develop away from hazardous areas that are more stringent than state mandated standards or that have policies where no state standards exist.	19 villages

For CMPs that do not use state-established numerical setbacks or buffers to direct development away from hazardous areas, report the following:

Contextual measure	Number of communities
Number of communities in the coastal zone that are required to develop and implement land use policies to direct development away from hazardous areas that are approved by the state through local comprehensive management plans.	19 villages
Number of communities that have approved state comprehensive management plans that contain land use policies to direct development away from hazardous areas.	19 villages

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Insufficient data	Update existing data that we have.	M
Lack of Enforcement	Need more stringent laws and/or policies	H

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High _X____
Medium _____
Low _____

Briefly explain the level of priority given for this enhancement area.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes _X____
No _____

Briefly explain why a strategy will or will not be developed for this enhancement area.

The Guam Coastal Management Program will prepare a “Tsunami Study for Southern Guam”.

With the Tsunami Inundation study conducted just recently that targeted three of Guam's populated areas, there is a need to develop a study on the Southern area of Guam. The hope is that the current and future studies can be utilized in supporting efforts to change setback legislation. Furthermore, the results from the study can be utilized to better identify what coastal areas exactly are susceptible to tsunami inundation and support any proposed changes to land zoning and building permit laws and regulations for such areas.

Public Access

Section 309 Enhancement Objective

Attain increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Characterize threats and conflicts to creating and maintaining public access in the coastal zone:

Type of threat or conflict causing loss of access	Degree of threat (H,M,L)	Describe trends or provide other statistics to characterize the threat and impact on access	Type(s) of access affected
Private residential development (including conversion of public facilities to private)	H	The Military Buildup has spurred development projects, including pending hotel and condominiums.	Coastal shoreline access for recreational uses, and fishing.
Non-water dependent commercial/industrial uses of the waterfront (existing or conversion)	M		
Erosion	L		
Sea level rise/ Great Lake level change	L		
Natural disasters	L		
National security	H	The Military Buildup will result in restrictions on accessing coastal areas	Coastal shoreline access for recreational uses, and fishing by land and water.
Encroachment on public land	L		
Other			

2. Are there new issues emerging in your state that are starting to affect public access or seem to have the potential to do so in the future?

The Military Buildup proposes to utilize a large area on the east coast of Guam known as Pagat. There will be limited access to the shoreline area and there is also a surface danger zone that extends out 6 miles. Access may only be on the weekends and holidays. The coastal area is also a

significant pre-historic site on the National Register of Historic Places and has other unique geological features such a caves with fresh water.

3. **(CM)** Use the table below to report the percent of the public that feels they have adequate access to the coast for recreation purposes, including the following. If data is not available to report for this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.

Contextual measure	Survey data
Number of people that responded to a survey on recreational access	None
Number of people surveyed that responded that public access to the coast for recreation is adequate or better.	None
What type of survey was conducted (i.e. phone, mail, personal interview, etc.)?	None
What was the geographic coverage of the survey?	None
In what year was the survey conducted?	None

There is a lack of data about the public's view with regards to public shoreline access. There is as need to conduct such a survey. This can be part of a larger project. The Bureau needs to conduct an inventory and more detailed mapping of current trails, and parks that provide public access to the ocean shoreline. The results can be utilized to educate the public about the existing access areas during a survey and/or outreach effort. .

4. Briefly characterize the demand for coastal public access within the coastal zone, and the process for periodically assessing public demand.

Being that Guam's weather is favorable for year around for marine activities we believe the overall demand for costal public access is fairly high. Especially on weekends and holidays. This is especially evident with most public parks and beaches on the coast occupied.

5. Please use the table below to provide data on public access availability. If information is not available, provide a qualitative description based on the best available information. If data is not available to report on the contextual measures, please also describe actions the CMP is taking to develop a mechanism to collect the requested data.

Types of public access	Current number(s)	Changes since last assessment (+/-)	Cite data source
(CM) Number of acres in the coastal zone that are available for public (report both the total number of acres in the coastal zone and acres available for public access)	26,872 acres of reef including 1,721 acres of lagoon		From CZMA Performance Measurement System, March 2006
(CM) Miles of shoreline available for public access (report both the total miles of shoreline and miles available for public access)	Total shoreline Length Approx. 124 miles. Exact coastline length currently not available but it may be approximately 75% of total, which is 93 miles		
Number of State/County/Local parks and number of acres	Approximately 211 sites . 10,626.911 acres.	0	Section 309 Assessment and Strategy 2006
Number of public beach/shoreline access sites	99	+80	From CZMA Performance Measurement System, March 2006
Number of recreational boat (power or non-power) access sites	9	+1	GCMP Personal knowledge
Number of designated scenic vistas or overlook points	14 sites and 115.8 acres	0	Section 309 Assessment and Strategy 2006
Number of State or locally designated perpendicular rights-of-way (i.e. street ends, easements)	18	Not applicable	Public Beach Access file records
Number of fishing access points (i.e. piers, jetties)	8	+7	GIS Manager
Number and miles of coastal trails/boardwalks	Not available		
Number of dune walkovers	Not applicable		
Percent of access sites that are ADA compliant access	Not Available		

Types of public access	Current number(s)	Changes since last assessment (+/-)	Cite data source
Percent and total miles of public beaches with water quality monitoring and public closure notice programs	64 percent of Public beaches, Miles not available at this time		Surface Water Monitoring and Assessment GEPA 2010 Integrated Report
Average number of beach mile days closed due to water quality concerns	Not Available at this time		

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Statutory, regulatory, or legal system changes that affect public access	Y	N
Acquisition programs or policies	N	N
Comprehensive access management planning (including GIS data or database)	Y	N
Operation and maintenance programs	N	N
Alternative funding sources or techniques	Y	N
Beach water quality monitoring and pollution source identification and remediation	Y	N
Public access within waterfront redevelopment programs	N/A	N
Public access education and outreach	Y	Y

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Other (please specify)		

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.
 - a) Characterize significant changes since the last assessment;
 - b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
 - c) Characterize the outcomes and effectiveness of the changes.

There has been little significant changes including improving access as a result of Homeland Security which not yet to be resolved, Public Access is under the authority of the Department of Parks and Recreation. The GCMP has not been involved with access projects in the past, however we recognized that there is a greater need to access Guam natural and culture resources and the GCMP will be elevating this issue during this next 5 year period. It is expected that a change in authority and legislation will be sought to clarify the authority of the access to natural resources and perhaps change the agency responsible for enforcement and implementation.

3. Indicate if your state or territory has a printed public access guide or website. How current is the publication and/or how frequently is the website updated? Please list any regional or statewide public access guides or websites.

Guam has an access guide for beach access for the tourist area. A draft access map was developed however due to other priorities, the maps was never completed. Additional access guides for trails, rivers, streams, caves and other popular hiking areas are available but only through printed books sold locally.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Public Access Stakeholder Survey	Data	H
Enforcement of access	Regulatory	H

Conservation easement programs	Policy	H
Laws protecting and establishing public access need to be strengthened	Regulatory and policy	H
Lack of capacity for lead public access agency	Agency needs trained personnel to ensure PA for the community through various legal mechanisms	H
Comprehensive mapping and inventory of all PA sites	Capacity. This task may have to be carried out by the CMP who has expertise	H

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High __X__
Medium _____
Low _____

Briefly explain the level of priority given for this enhancement area.

Guam's residents and thousands of visitors expect adequate access to coastal resources for a wide range of activities. The need for better public access has become even more critical given the growing population, potential user conflicts requiring new spaces to accommodate changing use patterns. GCMP will place a higher priority on this enhancement area to ensure that public access is available, given the rapid development and security or safety issues that are arising due to military buildup activities.

Adequate access trails exists, but support in terms of access route signage, facilities for the disabled, parking and restrooms (and their maintenance) are lacking.

There are still significant issues in increasing public access to marine resource areas. Especially since the increased Homeland Security concerns have closed or restricted access to certain areas. Access for the disabled, mentioned in the past assessment also remains a concern.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes __X__
No _____

Briefly explain why a strategy will or will not be developed for this enhancement area.

In the populated north much of the coastal areas are owned by the military. The geology of the north consists basically an upraised limestone plateau's resulting in steep cliff lines near the ocean shore. As a result some of the areas are very difficult to access. Due to these two factors in the populated north there are is not a lot of public access areas. Most are forced to head further south towards Tumon Bay and Tanguisson.

Central and most southwestern coastal areas are more easily accessible. Tumon is the tourism capital.

A survey will be conducted to obtain the public's understanding of public access issues as well as getting an updated inventory of access sites.

Marine Debris

Section 309 Enhancement Objective

Reducing marine debris entering the Nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. In the table below, characterize the significance of marine/Great Lakes debris and its impact on the coastal zone.

Source of marine debris	Extent of source (H,M,L)	Type of impact (aesthetic, resource damage, user conflicts, other)	Significant changes since last assessment (Y or N)
Land Based – Beach/Shore Litter	H	Aesthetic, Resource damage, Health	N
Land Based – Dumping	H	Aesthetic, Resource damage, Health	Y
Land Based – Storm Drains and Runoff	H	Aesthetic, Resource damage, Health	N
Land Based – Fishing Related (e.g. fishing line, gear)	M	Aesthetic, Resource Damage	N
Ocean Based – Fishing (Derelict Fishing Gear)	L	Resource damage	N
Ocean Based – Derelict Vessels	L	Resource damage	N
Ocean Based – Vessel Based (cruise ship, cargo ship, general vessel)	L	Resource damage	N
Hurricane/Storm	H	Aesthetic, Resource Damage, Health	N
Other (please specify)			

2. If information is not available to fill in the above table, provide a qualitative description of information requested, based on the best available information.

3. Provide a brief description of any significant changes in the above sources or emerging issues.

On-shore Litter: Through very successful Coastal Clean Ups and other shoreline cleanups, GCMP is able to track the types of trash that appear on Guam's shore. The most predominate trash is from picnic goers who leave their trash including cigarette buds, aluminum cans and plastics. There has been increasing awareness on the issues of trash on the beach. During the past two years, the number of sites has more than doubled with the amount of litter collected increasing by 16%.

Commercial Fishing: Studies have shown that from 2006 to 2010 we have seen a significant decline in the amount of transshipped tuna from our homeport. This would be substantiated in the fact that according to the fisheries committee there has been a decline in Chinese and Taiwan long liner activity at Guam's port. Many of the companies have down sized and Guam's Port Fees have increased. Although there is no official record of the amount of discarded nets there should be a disposal system to address this problem. Drift nets impact negatively by entangling marine mammals, turtles, and even sea birds, some of which are killed by them. It is important to note that these nets could be as long as two football fields and are made of synthetic material which can slowly decay and drift for a very long time. There have been reports from divers of discarded fishing lines and nets found during the annual Guam Coastal Cleanup events. There has been no study to determine the extent of the problem on Guam, but as migration patterns of targeted pelagic fish stocks shift with season or with occurrences such as El Niño and La Niña, the foreign carriers are responding to the realities of the fishery. Although Guam has a limited Exclusive Economic Zone, long liners and Purse Seiners continue to fish in our waters.

Storm Debris: Guam has not had a storm within the last five year. Although debris resulting from storm is significant, during this period storm debris has not been an issue.

Recreational/Subsistence Fishing: Subsistence fishing and marine harvesting continues to increase on Guam. Unemployment has increased from 7.7% in 2004 to 9.3 % during the past assessment period, unemployment is only a small factor. In order to offset the overfishing to our near shore waters, Marine Preserve Areas (MPA) that were implemented by Public Law 24-21 continue to benefit the island by either allowing particular fishing methods or completely eliminating all fishing. These Marine Protected Areas have been limited to a few fishing techniques and are monitored constantly for fishing violators. Because most of these same fishing lines are made of artificial material such as nylon or polyethylene they can persist in the marine environment for many years.

Data from 2006-2010 have shown an increase from 344 fishing lines to 421 line, however nets collected have decreased from 199 to 118. Data has been collected by volunteer groups that dive off shore to conduct the cleanup.

3. Do you use beach clean-up data? If so, how do you use this information?

Yes. International Coastal Cleanup has increase from 16 clean- up sites to 21 sites with over 3000 participants. The data is used in the development of outreach programs to encourage the community to recycle. The data is also used by other agencies to support their grant proposals to

strengthen the need for programs to reduce cigarette litter. The International Coastal Cleanup reports have played a direct role in creating recycling and other programs to reduce the impact to the island's land fill.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	Employed by state/territory (Y or N)	Employed by local governments (Y, N, Uncertain)	Significant changes since last assessment (Y or N)
Recycling requirements	Y	Y	Y
Littering reduction programs	Y	Y	Y
Wasteful packaging reduction programs	Y	Y	N
Fishing gear management programs	N	N	N
Marine debris concerns in harbor, port, marine, & waste management plans	Y	Y	N
Post-storm related debris programs or policies	N	N	N
Derelict vessel removal programs or policies	N	N	N
Research and monitoring	Y	Y	N
Marine debris education & outreach	Y	Y	N
Other (please specify)			

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.
 - a) Characterize significant changes since the last assessment;
 - b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
 - c) Characterize the outcomes and effectiveness of the changes.

Guam continues to struggle with its solid waste management efforts and, since the last assessment, the island's public solid waste system was placed under federal receivership due to noncompliance with the Clean Water Act and a federal court case initiated by the U.S.

Environmental Protection Agency. Under the receiver, significant changes have been made and a new sanitary landfill is expected to be operational within the next few years. There are a number of additional programs, including the recently revived island wide recycling program, designed to remove larger waste such as cars and appliances from the community. Coastal cleanups are a regular occurrence and many organizations sponsor trash pickup programs as service events.

These positive changes are countered by social and economic realities. Families unused to paying for waste disposal may struggle with new fees, and many people continue to dump garbage, white goods and vehicles across the island. Though this is not a new problem, it may become a more significant threat as fees for the new landfill and waste pickup continue to increase.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Enforcement for existing laws related to marine debris	regulatory	M
Research related to extent of fishing gear and boat debris	Data for policy	M
Public outreach program	Communication and outreach	M

Previous assessments linked a gap at the extent of net debris on Guam's eastern shoreline. Most of the shore is difficult to access, but provides the most logical landing area for debris given our island's ocean currents. This has not been studied and has not been identified as a major issue to date but will be addressed in the future.

Agencies need more information on the extent of net debris on Guam's eastern shoreline. Most of the shore is difficult to access, but provides the most logical landing area for debris given our island's ocean currents.

There is also a gap in the information regarding boat debris (sunken and rusting vessels) in the Apra Harbor area, and in accessing regional information regarding the debris contributions of distant waters fishing fleets. Securing of this information will require funding, which is not currently available.

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High _____
Medium X _____
Low _____

Briefly explain the level of priority given for this enhancement area.

Though Guam has many longstanding concerns about debris, mostly land-based, impacting coastal resources, the concerns associated with marine debris are not as urgent nor as pressing as the other enhancement areas. Further, there have been significant positive changes in some of the most problematic waste disposal areas, so GCMP will continue to rate this as a medium priority.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes _____
No X _____

Briefly explain why a strategy will or will not be developed for this enhancement area.

At this time, this enhancement area is supported by other networking partners and is not one of the GCMP priorities. During the next 309 period, priorities were selected based on immediate needs related to the increase in development due to the military buildup.

Cumulative and Secondary Impacts

Section 309 Enhancement Objective

Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources.

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Identify areas in the coastal zone where rapid growth or changes in land use require improved management of cumulative and secondary impacts (CSI) since the last assessment. Provide the following information for each area:

Geographic area	Type of growth or change in land use	Rate of growth or change in land use (% change, average acres converted, H,M,L)	Types of CSI
Apra Harbor and surrounding coastal area	Increasing activity and development	Rapid growth and large area conversions	Increased sedimentation, poor water quality, physical disturbance, change in water flow and current patterns
Northern Guam	Increased development, loss of large tracts of vegetation, increased impermeable surface	Rapid growth and large area conversions – forest to residential, commercial, multi-family residential; low density residential to high density uses.	Storm water and runoff concerns, loss of habitat, loss of connectivity between habitats, water quality concerns and others
Island-wide ancestral lands	Increased development and potentially incompatible land uses	Rapid growth and large area conversion – extent presently unknown	Storm water and runoff concerns, loss of habitat, water quality degradation, potential contamination and pollution problems
Department of Defense Properties			Properties identified in the Record of Decision to support the Military build up

2. Identify sensitive resources in the coastal zone (e.g., wetlands, water bodies, fish and wildlife habitats, critical habitat for threatened and endangered species) that require a greater degree of protection from the cumulative or secondary impacts of growth and development. If necessary, additional narrative can be provided below to describe threats.

Sensitive resources	CSI threats description	Level of threat (H,M,L)
Coral reef	Sedimentation, degradation of water quality, altered water flow and current patterns	H
Critical habitat	Loss of habitat and loss of connectivity between habitats. Loss of foraging area.	H
Fish and wildlife habitat	(See above)	H

Military Buildup

The Department of Defense will relocate 8,000 Marines, their dependents, and various other military personnel to Guam during the course of the next five years or so. This incredibly large relocation project, the first of its size since the end of World War II, will change the face of the island. Guam is bracing for the impacts that will be associated with this buildup but the island has already seen some indication of what is to come during the early projects that have broken ground in 2009 and 2010.

A massive worker housing project in northern Guam led to the clearing of huge expanses of limestone forest, a scene to be duplicated around the north as the forest is cut to make room for houses, office facilities, training grounds, and other military needs. Consequently, there is less available habitat for endangered species recovery, a loss of the ecosystem services provided by these important habitats, greater potential for pollution and erosion due to the replacement of native vegetation with impermeable surfaces, and potential effects on nearby coastal areas. Further, the increased demand for water and wastewater services may overwhelm an already fragile infrastructure system, leading to more problems with water quality, both within the aquifer system and in surrounding coastlines due to sewage leaks, and additional volume of discharge at the sewage outfalls.

The worker housing project is just one example of the many large projects that are slated to break ground in the next few years. Guam's limited size and geography makes any development likely to produce cumulative and secondary impacts, and the scale of the buildup and its associated work will only exacerbate these problems. Because so many projects will be occurring around the island in a compressed time frame, the stress on natural resources will be immense. This pressure is unlikely to be relieved when construction is completed, as the loss of such a large area of natural habitats is certain to have long lasting effects that we may not fully realize for years to come. These effects range from water quality concerns to loss of coral reef habitats due to major increases in contaminants washing into coastal waters, increasing sedimentation

and erosion due to large scale development, the loss of available habitat for many species, and other issues.

The military projects will not be the only major development challenges facing Guam in coming years. To meet the needs of a rapidly growing population and a large number of temporary workers, the private sector already is increasing housing stocks, developing new areas and proposing new projects to cater to a new clientele.

The increasing pressure on resources also will occur as a result of the huge population influx. Guam already has seen cases of illegal harvest of species not normally targeted here, as more than 10,000 sea cucumbers were confiscated in 2010 from individuals claiming they were for a “family party.” As new groups come to island during the buildup activities, this kind of activity will only increase, but local laws and regulations may not be sufficient to address very different types of harvest pressure and resource use. Generally, the increasing population could cause significant impacts even without outright harvest, as corals are easily damaged by recreational users and the increasing human presence in coastal waters may impact this ecosystem in ways that are not yet clear to resource managers.

Other concerns

The recent release of hundreds of acres of previously unzoned “ancestral lands,” which were condemned by the military after World War II, recently returned to the local government and passed to the original landowners’ estates, requires careful management to control development and the potential for environmental damages. Local policy makers also have increased an old practice of “spot zoning,” where land uses are changed with special interest legislation that is outside the normal zoning process. In some recent cases, agriculturally zoned lots were changed to light industrial zoned lots with a few pen strokes, bypassing the protective process normally in place to allow such major changes in land use. Some other lots were granted a zone designation by the government despite having no previous zoning history. These proposals have become law, and many other zoning change bills have been introduced in the current legislature.

- Public Law 29-153, January 2009. Agriculture to commercial in Barrigada
- Public Law 29-152, January 2009. Agriculture to light industrial in Barrigada
- Public Law 29-145, January 2009. From unzoned to light industrial in Dededo
- Public Law 29-25, October 2007. Unzoned to light industrial in Dededo

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management Categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Regulations	Y	N
Policies	Y	Y
Guidance	Y	N
Management Plans	Y	Y
Research, assessment, monitoring	Y	Y
Mapping	Y	Y
Education and Outreach	Y	N
Other (please specify)		

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.
 - a) Characterize significant changes since the last assessment;
 - b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
 - c) Characterize the outcomes and effectiveness of the changes.

The most significant achievement under this enhancement area is the completion of Guam's Mitigation Strategy, a project supported by 309 funds. The strategy is the first of its kind for Guam and will be a vital tool in developing the most appropriate mitigation projects for the many varied and large scale projects within the military buildup plans. The strategy focuses on approaches that are intended to mitigate not just the numbers of habitat or resources lost, but the ecosystem services that are a result of such losses. We are hopeful that this approach will provide the best outcomes for mitigation projects that, in the past, have been little more than paper plans with no implementation or monitoring to determine effectiveness.

Through the new strategy document, Guam will be able to offer alternatives that help replace ecosystem functions lost through major developments. The strategy will be tested during the immediate surge of military projects but its basic principles will apply to all large developments, including private projects that are slated to occur in the near future.

Other developments under this enhancement area include new monitoring programs, discussed in detail under Ocean Resources. These programs will help Guam identify long-term and secondary impacts as a result of major developments, particularly on coral reefs where baseline data and regular, consistent monitoring information has not always been readily available.

With regard to public outreach and communications, GCMP continues to stress the need for a more informed, more educated and more active public. Several publications, hearings, information sessions and meetings have been conducted throughout this assessment period in an

effort to help people become more meaningfully involved in the environmental impact statement process for the military buildup. Empowering the public to become involved in these efforts has many benefits, including a stronger voice for conservation and more participation in environmental protection efforts.

Watershed management plans are being developed for the Piti/Asan watershed and the Menuel/Geus watershed. Both of the plans are non 309 funds. The expected outcomes will be better management of critical watershed and reduced sedimentation in rivers and streams and improved coral reef health in adjacent MPAs.

Monitoring is being completed through a comprehensive monitoring program funded by Coral Reef Initiative Funds. Guam's monitoring plan builds upon the work already accomplished through past NOAA Coral Reef Ecosystem Monitoring Grants. It incorporates existing monitoring programs and uses modified versions of techniques developed for the five long term monitoring sites and coral disease monitoring conducted by researchers at the UOGML (funded by FY2005 and FY2006 monitoring grants) to collect comprehensive data from permanent sites around the island of Guam.

The primary goals of the Guam Coral Reef Monitoring Plan are to:

- Determine the status and trends in selected coral reef ecosystem indicators to better inform the resource manager's decision making process and increase the effectiveness of natural resource management on Guam.
- Provide managers with early notice of abnormal conditions of selected resources to encourage effective mitigation measures and reduce the costs of management.
- Provide data to better understand the dynamic nature and condition of the island's coastal ecosystems.
- Allow natural resource agencies to meet certain legal and Congressional mandates related to coastal resource protection.
- Measure progress towards performance goals.

Conservation/Development Suitability Analysis Utilizing GIS and Green Infrastructure.

Conduct an analysis utilizing Geographic Information Systems (GIS) and Green Infrastructure Concepts to strategically determine areas on Guam where conservation of natural resource areas or land development should ideally occur. The primary consideration here should be to strategically conserve our limited natural resource areas while identifying those areas that are more suitable for development.

The results of the analysis will be utilized to help guide policy in preserving natural resources areas while allowing for more development in other areas. Presently there the local conservation areas are very limited and the laws that may protect them may not be adequate to do so in the face of shrinking land and their associated natural resources.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Need updates to old fishery and harvest regulations using more current sources of information about populations and ecosystem health	Regulations for harvest and resource use	H
Outreach and education – access to new ethnic groups, transient workers and new groups expected to be on Guam due to the buildup	Outreach	H
Effective training for contractors and workers on best practices and specific local conditions	Outreach	H

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High X
Medium
Low

Briefly explain the level of priority given for this enhancement area.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes X
No

Briefly explain why a strategy will or will not be developed for this enhancement area.

For Guam, gaps in addressing the objectives arise from a number of sources, including regulatory and statutory authority relating to land use practices. To offset this situation, Guam has been very active and aggressive in its endeavor to obtain full approval of its Guam Coastal Nonpoint Source Pollution Management Program, development of watershed plans, conservation action plans and in updating of the Northern and Central land Use Plan.

Gaps occur in the permitting process. Cumulative and secondary impacts are not formally addressed in the permitting of projects, in the application review process, or in the GLUC process but rather relies on the experience of the planner involved with the ARC. Analytical models and other tools are needed to fully determine the CSI a development within a particular watershed area. Data gaps and other tools to assist planner in determine CSI to the aquifer and to coral reefs are critical.

Soil erosion and sedimentation is one of the most serious and neglected sources of nonpoint source pollution on Guam. Its negative effects can be seen throughout Guam's rivers and streams and have contributed greatly to the degradation of our surrounding reef ecosystem. In the north, it contributes to negative impacts to our sole source aquifer system. Adoption of the rules and regulations for Guam Storm water and Sediment Control Manuel is critical.

Gaps occur in both limited available data and inadequacy of analytical methods related to the attempt to create a major shift in land use practices.

Although there are efforts to have the GCMP play an active role in Chamorro Land Trust and Ancestral Lands Programs zoning process, this effort has not had the momentum needed.

With the relatively rapid increase in both private and public development from the military buildup, the Government of Guam lacks all the necessary data and policies to adequate data and analytical models to address natural resource losses resulting from projects proposed by the developers. Very little has been done to address CSI issues as it applies to new development. The newly developed mitigation policy will assist in this effort to address lose of resources. A mitigation plan that evaluates area where mitigation projects can be conducted and develop guidelines for mitigation for Guam will assist GCMP in monitoring CSI.

Special Area Management Planning

Section 309 Enhancement Objective

Preparing and implementing special area management plans for important coastal areas

The Coastal Zone Management Act (CZMA) defines a Special Area Management Plan (SAMP) as “a comprehensive plan providing for natural resource protection and reasonable coastal-dependent economic growth containing a detailed and comprehensive statement of policies; standards and criteria to guide public and private uses of lands and waters; and mechanisms for timely implementation in specific geographic areas within the coastal zone. In addition, SAMPs provide for increased specificity in protecting natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, including those areas likely to be affected by land subsidence, sea level rise, or fluctuating water levels of the Great Lakes, and improved predictability in governmental decision making.”

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Identify geographic areas in the coastal zone subject to use conflicts that can be addressed through special area management plans (SAMP). Also include areas where SAMP have already been developed, but new issues or conflicts have developed that are not addressed through the current plan. If necessary, additional narrative can be provided below.

Geographic Area	Major conflicts	Is this an emerging or a long-standing conflict?
Coral Reefs/Bays/Lagoons/shoreline	Over Harvesting, near shore development, increased recreation, poor fishing practices, natural calamity	Long lasting conflict
Aquifer Recharge Area	Agriculture, community development, overuse, military build up	Long lasting conflict
Fragile Areas (wetlands, limestone forest, wildlife habitats and historic sites)	Development, military needs, water sports and tropical beach recreation and outright vandalism and theft of historic properties in historic sites.	Emerging conflict

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. Identify below any special management areas in the coastal zone for which a SAMP is under development or a SAMP has been completed or revised since the last Assessment:

SAMP title	Status (new, revised, or in progress)	Date approved or revised
Coral Reef Initiative	New - Guam Coral Reef Goal and Priorities New – Guam Coral Reef Long Term Monitoring Program	2010 2007
Guam Seashore Reserve	Guam Seashore Reserve Plan currently being completed for all shore areas from 10 fathom contour inland to 10 meters. Guam Seashore Reserve Task Force will seek approval of the Plan and submission to the Legislature.	2009

Aquifer Recharge Area	To address the potential contamination of the Northern Aquifer Recharge Area, the Bureau is proposing the North Central Guam Land Use Plan. After many stakeholder and village meetings conducted and a public hearing as required by law, the North and Central Guam Land Use Plan is now in its final stage of adoption by the Guam Legislature. The Plan is currently at the Guam Legislature for their review and action. If no action is taken by the Legislature, the Plan automatically becomes law.	2010
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2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.
 - a) Characterize significant changes since the last assessment (area covered, issues addressed and major partners);
 - b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
 - c) Characterize the outcomes and effectiveness of the changes.

Coral Reefs: In August 2002, the Guam Coral Reef Initiative Coordinating Committee (GCRICC) began the process of selecting and prioritizing the main threats to local coral reefs. They include Land Sources of Pollution, Fisheries Management, Public Outreach and Education, Recreation Use and Misuse, Coral Bleaching and Disease. This was not a 309 effort, but funded by CRI funds. The GCRICC had identified local navigators and drafted Local Action Strategies (LAS) for five chosen focus areas. Among the numerous benefits realized through these efforts, the LAS process significantly expanded and enhanced the network of stakeholder groups working on coral reef issues. The Guam Visitors Bureau and the tourism industry are now working with the natural resources agencies to market Guam's coral reefs, and in particular Guam's marine preserves, to the one million visitors that come to our island yearly. A new awareness of the economic value of our coral reef resources is beginning to create a sense of stewardship in the industry, absent during the economic boom of the 1980s and recession of the 1990s. Ultimately these new partnerships and increased support for improving the health of Guam's coral reefs and support for the Local Action Strategies projects.

Guam (Territorial) Seashore Reserve Plan: Using 309 funds, a contractor was originally hired to begin the Plan required to support the Territorial Seashore Protection Act. This plan will develop criteria for shoreline development, and addressing the procedure for use and/or development within Guam's waters from mean high water line to the 10 fathom contour. It also identified areas needing further planning, research and management activities in this SAMP. It is expected that this Plan, once adopted, will strengthen the existing law on shoreline development and will provide new protections against shoreline encroachments. The Guam Seashore Reserve Plan has gone through several stakeholder meetings with private, public and government agency reviews. Currently, the seashore reserve plan while still in draft form will be reviewed by the Guam Seashore Protection Commission again due to comments and recommendations addressed during the stakeholder meetings. In addition, incorporated into the draft plan are important comments provided by the Natural Resources Legal Counsel.

The Guam Seashore Reserve Task Force will meet with the Guam Seashore Protection Commission (GSPC) to submit the changes for their review and action. Once the Commission approves the Plan, GCMP will begin preparation for the Public Hearing process and submission to the Governor and the Legislature for their review and action.

Aquifer Recharge Area: The Northern Guam Lens serves as a source of potable water for Andersen AFB and residents of Guam. Under the Safe Drinking Water Act, the aquifer has been designated a sole source aquifer. The high overall quality of Guam's coastal waters is being threatened by pollution from various sources. The island's underground water supply can be polluted by uncontrolled development, illegal dumping of organic/inorganic compounds, lack of sewers, the use of pesticides, or saltwater intrusion from over-pumping wells.

Due to the high percolation rate in northern Guam, and the multitude of land use activities that exist in this area, the potential for contamination is high. Some of these areas in northern Guam lack the infrastructures such as running water and adequate sewer systems, both very important for good public health. The lack of adequate infrastructure indirectly affects water quality, not to mention sanitary conditions to maintain good health.

To address such issues, the Bureau of Statistics and Plans and Guam Coastal Management Program has embarked in the proposed North and Central Guam Land Use Plan which will represent the islands view for the future, its goals, objectives and policies to ensure the protection of our natural resources as a result of the anticipated development of our island. Should the Plan be approved will become an official element to Guam's Comprehensive Development Plan (CDP). With the impending military buildup on Guam, the Plan's adoption as an element to the CDP will ensure that as we move forward in planning for Guam's future growth and development, our island is built for sustainability and compatibility and to ensure that our quality of life is maintained. The Plan's adoption will ensure that the northern aquifer is protected from any activity that may contaminate our precious resources.

Due to increasing development intended to accommodate various needs of workers, a growing population, and an influx of military personnel during the buildup period, GCMP initiated a land use planning process focusing on the most heavily and densely populated areas of the island, in northern Guam. After hearings, stakeholder input and a variety of consultations, the plan is essentially complete and awaiting formal approval from local leaders.

This process, supported by 309 funds, created a plan to provide guidance on appropriate development and uses over the northern aquifer, which serves the great majority of the island's water needs. Recent ongoing studies under the "Groundwater under direct influence" (GWUDI) program, through Guam EPA and the University of Guam's Water and Environmental Research Institute, verify the need for greater scrutiny of development over the aquifer and highlight the need to continue efforts to safeguard this resource.

For the island's marine preserves, the eco permit system has been years in the making under the direction of the Guam Division of Aquatic and Wildlife Resources, which manages the preserves. Currently in development, the permits will help find a balance between the growing demands of the public for recreational access to marine areas while protecting the marine life in Guam's preserve. This project also balances the concerns of local fishermen, who often object that heavy recreational use in the preserves threatens the progress made by reductions or prohibitions on fishing effort.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy).

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
With the military buildup before us, there are many positions available for knowledgeable people in the federal sector. Guam has lost many highly experienced personnel and support staff with environmental knowledge to the federal government due to higher wages and incentives. With the condition of our economy, and the attractive pay in the federal side, there is an inability to refill lost positions. It will undoubtedly take many years for Guam to recover from this action. Guam needs to be in a better position to have staff capable of reacting and responding to the rapid development pressures with legislation and regulations that are environmentally sensitive.	Capacity	High

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High

Medium X

Low

Briefly explain the level of priority given for this enhancement area.

During this assessment period, the SAMP remains a high priority. This is due to the increased role of the GCMP in Seashore Reserve as proposed in the draft plan, military buildup above the aquifer and throughout the island, and the increase awareness of the importance of Guam's coral reefs. This priority area remains high, mainly due to the major program change with the anticipated adoption of the Guam Seashore Reserve Plan. The anticipated program change will be realized in the expanded role in the strategy, and will be to support the new role of the Guam Coastal Management Program as a result of the hopeful adoption of the Seashore Reserve Plan. The GCMP will play the primary role and will further strengthen and refine the role of the GCMP in ensuring continued protection of the natural environment. The passage of this plan will strengthen the restrictions on shoreline activities identified within the Seashore Reserve. A public education program will enable the stakeholders to understand the importance of the plan and the new rules and regulations that will be implemented.

The large military presence and their proposed plans to develop make Guam vulnerable to many environmental issues not to mention the possibility of accidents during the normal transportation and storage of radioactive material, chemicals and explosives. Any accidents involving nuclear materials could have far reaching consequences on the island's population and economy. This ever-present threat should not be ignored.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes

No X

Briefly explain why a strategy will or will not be developed for this enhancement area.

The Guam Coastal Management Program will concentrate on the SAMPs already proposed. We do not want to be overwhelmed with what we plan to pursue.

Ocean/Great Lakes Resources

Section 309 Enhancement Objective

Planning for the use of ocean resources

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. In the table below characterize ocean and/or Great Lakes resources and uses of state concern, and specify existing and future threats or use conflicts.

Resource or use	Threat or use conflict	Degree of threat (H,M,L)	Anticipated threat or use conflict
Living Resources: Fishes, corals, mollusks, sea grasses, marine mammals	Over fishing, increased human presence in marine environment, sedimentation, pollution, ocean warming	High	Increased NPS, cultural pressures, increased commercial competition, toxification of resources
Non-living resources: marine minerals, sand	Management conflict between federal and local government	Low	Inadequate enforcement or monitoring because of management conflict
Ocean Space: wastes disposal	pollution	Medium	Increased dumping with shipping increases as Asian economies recover from recession
Maritime/ Navigation	Pollution/accidental oil spill	Medium	Continued transshipment of plutonium or other materials, destruction through grounds, introduced invasive marine species via shipping practices
Mariculture	Localized degradation of waters	Medium	Unknown

Recreation: tourism, boating, jet ski, scuba diving, swimming, surfing, etc.	Environment & safety hazards, user conflict, water quality degradation, disruption of living resources, “souvenir” taking of living resources	Medium high	Increased activities in tourism arrival, resident usage military personnel, and foreign workers
Harbors	Sedimentation, increased pollution levels, degrading of polluted sediments, marine invasive species.	High	Increased user conflict between military and commercial/civilian needs

2. Describe any changes in the resources or relative threat to the resources since the last assessment.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Comprehensive ocean/Great Lakes management plan or system of Marine Protected Areas	N	N
Regional comprehensive ocean/Great Lakes management program	Y	Y
Regional sediment or dredge material management plan	Y	Y
Intra-governmental coordination mechanisms for Ocean/Great Lakes management	Y	N
Single-purpose statutes related to ocean/Great Lakes resources	N	N
Comprehensive ocean/Great Lakes management statute	N	N
Ocean/Great Lakes resource mapping or information system	Y	Y

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Ocean habitat research, assessment, or monitoring programs	Y	Y
Public education and outreach efforts	Y	Y
Other (please specify)		

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.
 - a) Characterize significant changes since the last assessment;
 - b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
 - c) Characterize the outcomes and effectiveness of the changes.

The most significant change continues to be the support by the CRI to address issues identified in the island's Local Action Strategies and Guam's Coral Reef Priorities, the increased public awareness of the importance of Guam's reef to our economy, and the support for the implementation of the local MPA. The increase in the diversity and abundance of fish in the Tumon Bay Marine Preserve and the Piti Bomb Hole Preserve is very encouraging. The Marine Eco Permit is also supported by both the diving community and other operator of recreational activities. Department of Agriculture has started a study to determine types of activities to be conducted within each MPA. This study will resolve user conflicts between various recreational users. Activities are supported not just by CRI funds but CZM and Sport Fish from Department of Agriculture as well.

Another significant change has been in the development of a long term monitoring program for the Government of Guam. Guam's monitoring plan builds upon the work already accomplished through past NOAA Coral Reef Ecosystem Monitoring Grants. It incorporates existing monitoring programs and uses modified versions of techniques developed for the five long term monitoring sites and coral disease monitoring conducted by researchers at the UOGML to collect comprehensive data from permanent sites around the island of Guam.

The primary goals of the Guam Coral Reef Monitoring Plan are to:

- Determine the status and trends in selected coral reef ecosystem indicators to better inform the resource manager's decision making process and increase the effectiveness of natural resource management on Guam.
- Provide managers with early notice of abnormal conditions of selected resources to encourage effective mitigation measures and reduce the costs of management.
- Provide data to better understand the dynamic nature and condition of the island's coastal ecosystems.

- Allow natural resource agencies to meet certain legal and Congressional mandates related to coastal resource protection.
- Measure progress towards performance goals.

U.S. All Island Coral Reef Initiative Coordinating Committee: Comprised of the USCRI points of contact for Guam, CNMI, Hawaii, American Samoa, Puerto Rico and U.S. Virgin Islands, this group has projects to be undertaken jointly and shared for coral reef resource management and protection in U.S. affiliated waters.

Western Micronesian Chief Executive Council: The Governors of Guam, the Commonwealth of the Northern Mariana Islands, and the President of the Federated States of Micronesia, the President of the Republic of the Marshall Islands and the President of the Republic of Palau have committed to address critical issues that affect all islands of the region. This is a regional approach to partner and share resources to address these issues with the limited resources. One of the important issues addressed by this body is management of the ocean's natural resources.

Western and Central Pacific Fisheries Commission: Formed to manage tuna resource, shared by islands of the region. Guam may participate, along with neighboring island countries and fishing nations. Changes in the Magnusson-Stevens Act have encouraged community based programs within Guam communities. This change has resulted in conflict between implementation of local fishing initiatives and initiatives supported by WESPAC.

US EPA Ocean Disposal Site: Although there has been a ocean disposal site within Guam's EEZ, a new location has been determined to support the expected work in the expansion of wharfs in Apra Harbor and Guam's Port Authority of Guam.

Coral Reef Ecosystems of the Marianas Archipelago: 2003-2007 Overview. Summary of NOAA's cruise ship studies in the Marianas. The report is a comprehensive analysis of the Pacific Reef Assessment and Monitoring Program research survey conducted in the Mariana Archipelago in 2003, 2005, and 2007 by the Coral Reef Ecosystem Division (CRED) of the NOAA Pacific Islands Fisheries Science Center with the support from NOAA's Coral Reef Conservation Program.

Micronesian Challenge In 2006, Governor Felix Camacho joined the leaders of the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia and the Republics of the Marshall Islands and Palau in committing to the Micronesia Challenge.

The Challenge is an initiative calling for effective conservation of 20 percent of terrestrial and 30 percent of near shore resources by 2020. Since its creation, the MC has grown to include some endowment funding and an active network of conservation managers and policy specialists working to meet these goals. As a framework for Guam's various ongoing resource management and conservation efforts, this initiative has helped focus efforts on effective conservation and the need for reasonable monitoring mechanisms to document progress and guide strategy development.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need Description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H, M, L)
Coordination for regional and local efforts	Policy	M
Fisheries and Resource Mapping	data	M

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High _____
Medium X
Low _____

Briefly explain the level of priority given for this enhancement area.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes _____
No X

Briefly explain why a strategy will or will not be developed for this enhancement area.

Ocean resources are not just another economy, or another issue to small islands. Ocean resources are essential to the continuance of the community, and as populations increase, new activities are created for getting people into the marine environment (ski bobs, jet skis, sea walkers, hover craft, etc.), and as the need for harvesting sea resources increases for local needs and for a world food source, the understanding (data), improvement of laws (management) and monitoring of these resources become increasingly more important. There are tremendous opportunities to make significant improvements to the health of Guam's reef with increased funds from CRI.

Although, during the last assessment Ocean Resource was a medium priority, due to more immediate concerns such as the military buildup, implementation of programs that address coral

reef issues, limited 309 funds, and opportunities for funding sources, a medium priority is again assigned to Ocean Resources.

Energy & Government Facility Siting

Section 309 Enhancement Objectives

Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and Government facilities and energy-related activities and Government activities which may be of greater than local significance

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. In the table below, characterize the types of energy facilities in your coastal zone (e.g., oil and gas, Liquefied Natural Gas (LNG), wind, wave, Ocean Thermal Energy Conversion (OTEC), etc.) based on best available data. If available, identify the approximate number of facilities by type.

Type of Energy Facility	Exists in CZ (# or Y/N)	Proposed in CZ (# or Y/N)	Interest in CZ (# or Y/N)	Significant changes since last assessment (Y or N)
Oil and gas facilities	Y	N	N	N
Pipelines	Y	N	N	N
Electric transmission cables	Y	Y	Y	Y
LNG	N	N	N	N
Wind	N	Y	Y	Y
Wave	N	N	N	N
Tidal	N	N	N	N
Current (ocean, lake, river)	N	Y	Y	N
OTEC	N	Y	Y	Y
Solar	N	Y	Y	Y
Other (please specify)				

2. Please describe any significant changes in the types or number of energy facilities sited, or proposed to be sited, in the coastal zone since the previous assessment.

Guam is shifting towards renewable energy sources. Within a few years Guam will be experiencing an increase in population as the U.S. military redeploys thousands of its forces from Japan. The influx will bring about many projects that will not only fuel the economy but will clearly threaten Guam's environment and its aging infrastructure. Thus, solar and wind tower site assessment studies have been conducted by the Guam Power Authority (GPA). The U.S. Navy also conducted a study on a wind study to provide data on Navy property for the period of October 2008 thru November 2009. Additionally, GPA has initiated an Integrated Resource Plan (IRP) in 2008. This plan is an open dialogue between

the Authority and its stakeholders to determine the best strategies for the type, amount and timing of new resource acquisitions to meet future electrical loads. One of the primary recommendations within the plan is to procure wind (or other renewable energy) projects.

3. Does the state have estimates of existing in-state capacity and demand for natural gas and electric generation? Does the state have projections of future capacity? Please discuss. As Guam prepares for the military buildup, the Commission on Consolidated Utilities (CCU), who is responsible for managing Guam's infrastructure completed a assessment of the electric generation required to meet the power demands of the additional population. An agreement has been reached with the DOD through and MOU to ensure that funding will be provided to build the required infrastructure. In addition, the Guam Power Authority is also looking into alternative energy sources that are more sustainable.
4. Does the state have any specific programs for alternative energy development? If yes, please describe including any numerical objectives for the development of alternative energy sources. Please also specify any offshore or coastal components of these programs.

Public Law 29-62: In 2008, Guam law 29-62 was established to promote the development of renewable energy. It directs the Guam Power Authority (GPA) to establish renewable portfolio standard goals; and for the Public Utilities Commission to study the feasibility of implementing a rate structure to encourage the use of renewable energy.

Executive Order 2010-15: Governor Camacho signed Executive Order 2010-15, which established the Guam Energy Task Force and made it responsible for creating a strategic energy plan for the island by developing and implementing a long-term Guam Energy Strategic Plan. The task force will tap into the expertise of Guam's energy, business, scientific, academic, non-profit, and government sectors, thus allowing the island to speak with a unified voice on energy issues. Members include representatives of UOG, GEO, GPA, the Guam Chamber of Commerce, the Guam Hotel and Restaurant Association and the Mayor's Council of Guam. The task force will be assisted by several federal partners including NREL, DOI, the Department of Defense, the U.S. Environmental Protection Agency and the U.S. Department of Agriculture.

Energy Task Force: The task force is in collaboration with a team from the National Renewable Energy Laboratory. The team was on island this month (Oct. 2010) for about a week to meet with the different stakeholders and conduct technical assessments. They are evaluating land access and potential crops that can be grown for biofuel.

University of Guam: In April 2009, the University of Guam signed a teaming agreement Battelle for environmental sustainability and renewable energy projects. Battelle is an international science and technology enterprise that explores emerging areas of science, and develops and commercializes technology. The University of Guam will seek federal funding for energy assessments and modeling for Guam and Micronesia; renewable energy assessments and implementation; environmental sustainability and alternative energy

education and outreach; and public/private financing options and services for environmental sustainability and renewable energy programs and projects.

5. If there have been any significant changes in the types or number of government facilities sited in the coastal zone since the previous assessment, please describe.

Through public/private partnerships 5 schools have been built. HUD's community block grant has funded 1 health facility, 2 fire stations and 3 police satellite offices, a community swimming pool and a skate park.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. Does the state have enforceable policies specifically related to energy facilities? If yes, please provide a brief summary, including a summary of any energy policies that are applicable to only a certain type of energy facility.

No, GCMP does not have an enforceable policy that address energy, it we do have one for Government Siting. As we prepare for the build up, it will be necessary to address this gap in the program to ensure that we have the proper authorities to address emerging energy sources such as wind, solar and ocean sources.

A Guam Energy Building Code exists; however, this is not enforceable as it has not been adopted into law.

2. Please indicate if the following management categories are employed by the State or Territory and if there have been significant changes since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Statutes or regulations	N	N
Policies	N	N
Program guidance	N	N
Comprehensive siting plan (including SAMPs)	Y	N
Mapping or GIS	N	N
Research, assessment or monitoring	N	N
Education and outreach	Y	N
Other (please specify)		

3. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.
- Characterize significant changes since the last assessment;
 - Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
 - Characterize the outcomes and effectiveness of the changes.

Several studies have been conducted since the last assessment period, which include:

- 2009 Solar Siting Study conducted by Winzler and Kelly. The study evaluates undeveloped properties on Guam for potential solar plant siting by the Guam Power Authority (GPA). The study concludes that there are numerous properties available on Guam that could support a 10 MW solar power plant. However, potential developers must include provisions to perform a System Impact Study for any potential site they may consider.
- GPA Wind Tower Site Assessment conducted by DNV Global Energy Concepts Inc. (DNV-GEC), identifies siting for two wind towers on Guam to evaluate potential wind farm siting. DNV-GEC has determined that 20 to 30 MW of wind energy generation is conceivable for well-exposed ridgelines in the Coastal and Pulantat (southern) areas. According to DNV-GEC “Although the wind resource is expected to be lower than typically sought for projects in the continental U.S., the high cost of power generated with diesel fuel provides a leveling effect. DNV-GEC recommends installing at least one 60-m monitoring tower and proceeding with one year of data collection. The estimated cost for this endeavor ranges from \$60,000 to \$80,000 per tower, depending on the availability of local tower installation contractors. Measurement of the wind resource is required to make more informed business decisions at this stage.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Awareness in energy efficiency and sustainable development concepts	Training	H
Implementation of the Guam Energy Building Code	Regulatory	H

Local policies regarding immerging technologies	regulatory	M
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Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High ✓

Medium

Low

Briefly explain the level of priority given for this enhancement area.

As Guam's economy and population – and the associated pressures on coastal resources – grows, the need to adopt more sustainable development practices becomes more pressing.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes ✓

No

Briefly explain why a strategy will or will not be developed for this enhancement area.

A movement towards clean, renewable energy, “smart growth” development practices, sustainable tourism practices, and other practices that promote long-term economic, cultural, and environmental integrity, would not only mitigate environmental impacts associated with population and development pressures, but would also provide significant benefits. Sustainable designs offer opportunities for energy savings, reduction of carbon emissions, increased property values, and a healthy environment.

Aquaculture

1. Section 309 Enhancement Objective

Adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone, which will enable States to formulate, administer, and implement strategic plans for marine aquaculture

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Generally characterize the private and public aquaculture facilities currently operating in your state or territory.

Type of existing aquaculture facility	Describe recent trends	Describe associated impacts or use conflicts
There are over 100 acres of ponds constructed, mainly in the southern region of the island, with several species being actively cultivated, including tilapia, milkfish, mullet, freshwater giant prawns, marine shrimp, Chinese carp and catfish.	Backyard aquaculture has significantly increased since its introduction in 1995 by the University of Guam Cooperative Extension, with nearly a dozen growers of tilapia, milkfish and catfish producing for sale to restaurants, roadside stalls and weekend flea markets.	Damage to earthen ponds, causing subsequent damage to nearby reefs. Water quality concerns and invasive species threats.
Western Pacific Tropical Research Center, College of Agriculture and Life Sciences, University of Guam	Recently, WPTRC researchers obtained funds to continuously look for ways to increase added value of existing products and /or increase consumer demand for new products. The scope of work conducted by WPTRC scientists is quite broad and researchers are regarded as experts in the fields of plant and animal sciences, bio-technology, food and nutrition, aquaculture, soils science, tropical agro-ecology, technical networking, and agricultural economics.	
Guam Aquaculture Development and Training Center: Shrimp	Guam Aquaculture Development and Training Center (GADTC) at the University of Guam has been	

Study	<p>awarded a \$60,000 grant from National Oceanic and Atmospheric Administration (NOAA) for a pioneering study in shrimp nutrition and genetics. Dr. Gong's group will estimate genetic variations of the utilization efficiency of plant proteins by different shrimp families of <i>Penaeus vannamei</i>, the most popular species of shrimp currently cultured worldwide. Nearly twenty families with a large genetic diversity will be evaluated using five dietary treatments representing different protein levels and percentages of marine and plant proteins.</p> <p>The results of this study will be useful in exploring the potential of an innovative approach to genetic selection. Improved efficiency of utilizing plant proteins by <i>P. vannamei</i> will lead to a decreased dependence on marine proteins in shrimp feed formulation.</p>	
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Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Aquaculture regulations	Y	N
Aquaculture policies	Y	N
Aquaculture program guidance	Y	N
Research, assessment, monitoring	Y	N
Mapping	Y	N
Aquaculture education & outreach	Y	N
Other (please specify)		

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.
 - a) Characterize significant changes since the last assessment;
 - b) Specify if it was a 309 or other CZM driven change (specify funding source) or if it was driven by non-CZM efforts; and
 - c) Characterize the outcomes and effectiveness of the changes.

No Significant change

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Gap in support from the Government of Guam	Gap in policy to developing a strategic plan for aquaculture development and to provide support in terms of permanent positions and funding for facilities and equipment.	L

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High _____
Medium _____
Low X

Briefly explain the level of priority given for this enhancement area.

Aquaculture efforts on Guam continue to be sporadic and generally small scale. Although the island has few aquaculture-specific regulations, new projects are subject to a range of local and federal environmental regulations that make it somewhat difficult for the smaller-scale projects to proceed, primarily due to water quality issues for both fresh and marine areas. Existing farms,

covering about 100 acres of earthen ponds and in much smaller above ground setups employed in backyard operations, have been “grandfathered” in as they have been existence for decades.

The University of Guam remains the lead agency for aquaculture development and continues to receive various grants for food fish and some ornamental production. In the future there may be greater interest but at this time the interest is nominal. It is not expected that the GCMP will be providing any limited funds from 309 to this effort.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes _____
No X _____

Briefly explain why a strategy will or will not be developed for this enhancement area.

There is not likely to be substantial, if any, growth in this area in the next few years, based on historic trends as well as the growing difficulty for farms and aquaculture operations to find affordable land for these projects. The University will be increasing its manpower and capabilities and will be better able to assist any aquaculture farmer should the need arise.

Guam Coastal Management Program

Section 309 Strategy

Summary

Although the Guam Coastal Management Program recognized that many areas in the assessment are critical, for this Assessment and Strategy, the Guam Coastal Management Program has identified three areas of High Priority; **Coastal Hazards, Public Access, Energy and Government Siting and Cumulative and Secondary Impacts**. Many of the gaps identified in priorities are costly to address due to limited personnel, the reduction of federal funds, the time frames imposed by the grant process, and more particularly, by the additional use of time for the bid and contract process, takes away significantly from the time available for product development itself. The projects identified in the strategy will be phased over several years and over several grant cycles. Although, the GCMP has identified four high priority areas, the strategy will concentrate on projects identified in **Coastal Hazards, Public Access, Energy and Government Siting and Cumulative and Secondary Impacts**. GCMP will not fund projects under Special Area Management Plans, Marine Debris, Ocean Resources and Aquaculture .

Since the Guam Coastal Management Program's last assessment was completed in 2006, the single biggest driving factor in determining the Sector 309 strategy is the large scale military buildup to move an estimated 8,000 Marines, their dependents and other military personnel to Guam. This move will be accompanied by major upgrades in existing defense properties, the construction of new facilities, and a large amount of private and local government development. Our highest priorities reflect the impacts and concerns that are associated with these activities, which will have tremendous effects on coastal resources during this phase of rapid development and booming population growth.

A major concern for our community during this challenging time is not just the health of local natural resources, but the public's continuing ability to use these resources for recreation, subsistence and cultural practices. As such, GCMP will undertake a project to quantify existing public access needs and concerns in an effort to best manage competing interests and increasing limits on meaningful access to our coastal areas, near shore waters and cultural sites. This difficult is highlighted in the proposed Marine firing range that the Department of Defense has proposed for the Pagat, Mangilao, area, where an important cultural site is located. The public outcry over this project has been unprecedented here and is raising greater awareness about other historical and cultural sites as well.

Among the projects will be proposing are a new policy to manage cumulative and secondary impacts associated with private sector development. The government of Guam currently has no structure in place requiring private developers to consider these impacts through local regulatory processes, and given the many pressures on the island's limited natural resources such a policy is long overdue. The policy, combined with the recently completed Guam Mitigation Strategy and

existing regulations, will help the island better understand these impacts and provide the best alternatives to mitigate damages to our resources.

To ensure that development is done in a sustainable way and to ensure that energy becomes part of the GCMP enforceable policies, this period the GCMP will do a project that will support green infrastructure, sustainable development and reduce the dependency on traditional power supplies.

To promote better zoning and building practices, GCMP also will undertake a tsunami inundation study for southern Guam. This project will build on existing work undertaken by partners to provide updated and more accurate information for southern Guam. Although the population has the sense that tsunamis are not as significant a threat to Guam as other hazards like typhoons or earthquakes, the recent human life and property losses from tsunamis in our region and around the globe are a warning to ensure that we are better prepared should such an event happen on Guam. In fact, in the limited historical data available for tsunami events on Guam, the single recorded casualty from a tsunami occurred in Talofofo Bay in the early 1900s.

These projects and ongoing work through both GCMP programs and our network of partners will help carry Guam through the next several years, when rapid, large scale development will challenge our resources. As such, GCMP's 2010 assessment reflects both the uncertainty of the immediate future and the ability to work through that uncertainty by focusing on the appropriate enhancement areas.

Task 1

Public Access for Guam's Natural and Cultural Resources Strategy

I. Issue Area(s)

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (*check all that apply*):

- | | |
|--|---|
| <input type="checkbox"/> Aquaculture | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Energy & Government Facility Siting | <input type="checkbox"/> Wetlands |
| <input type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Marine Debris |
| <input type="checkbox"/> Ocean/Great Lakes Resources | <input checked="" type="checkbox"/> Public Access |
| <input type="checkbox"/> Special Area Management Planning | |

II. Program Change Description

A. The proposed strategy will result in, or implement, the following type(s) of program changes (*check all that apply*):

- ☐ A change to coastal zone boundaries;
- ☒ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;
- ☐ New or revised local coastal programs and implementing ordinances;
- ☐ New or revised coastal land acquisition, management, and restoration programs;
- ☐ New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
- ☒ New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management.

B. Proposed Program Change(s) or Activities

First there is a need to gather data about the current Public Access (PA) conditions, laws, and attitudes. The data gathered will be utilized to formulate proposed changes or enhancements to public access conditions, and laws. For example the Department of Parks and Recreation is the lead agency with regards to Public Access. However it's lack of resources has necessitated the CMP to undertake tasks such as installing signage to identify those access easements. This fact and potential solutions to such barriers to adequate public access to the ocean shoreline will be examined as part of this strategy. The information gathered will be utilized to develop policies to strengthen public access laws.

III. Need(s) and Gap(s) Addressed

The ongoing Military Buildup will have impacts on public access to the ocean shore and associated resources. Though current public access laws are adequate for certain situations there are definitely weaknesses and gaps that do not protect the public's right to access to the ocean shore. A comprehensive review of the various laws to determine what changes are necessary to strengthen them is needed to ensure continued future public access to the ocean shore.

IV. Benefit(s) to Coastal Management

Strengthened public access laws will benefit the CMP. Identifying current conditions, public attitudes and addressing the ambiguities in jurisdiction, authority and enforcement of the current laws will help negate legal challenges to the laws and will hopefully result in more public access to the ocean shore for the community.

V. Likelihood of Success

In general, the community supports, and sometimes demands public access to the ocean shore so efforts to be undertaken with these projects should have a high likelihood of succeeding. The resistance to PA is normally by the individual/developer or agency that must provide PA on their properties. Recently efforts by a landowner/developer to close the Guam Beach ocean shore in Tumon, a legal easement, generated significant public outcry. That access easement was finally reopened. There is a need to conduct continuously update the inventory and mapping of PA locations and to educate the public of their locations, usage and benefits. This must also include efforts to educate the public about caring for such areas in keeping them trash free and protecting the natural and cultural resources that may exist. The deplorable conditions of some PA sites are one major reason for the resistance to establishing them on private properties. A PA maintenance program should also be pursued and established in order help reduce such resistance.

VI. Strategy Work Plan

Total Years: 2 Years

Total Budget: \$150,000.00

Final Outcome(s) and Products: Comprehensive law review with recommended changes put into legislation; Up-to-date Inventory of Public Access sites, Survey results on the state of Public Access for the island.

Year(s): 1

Description of activities: Data Gathering

1. Survey, Mapping and Inventory of all existing Public Access Sites to include condition of the natural and cultural resources associated with access sites, land ownership and compliance with ADA requirements; and

2. Survey on the Public's opinion on the state of Public Access to the Ocean shore and other significant natural and cultural resource sites.

Outcome(s): Up-to-date Inventory of Public Access sites, Survey results on the state of Public Access for the island.

Budget: \$75,000.00

Year(s): 2

Description of activities: Policy development

1. Comprehensive review of existing legislation, regulations, authorities, jurisdiction and enforcement related to Public Access to the Ocean Shore;
2. Develop public outreach and education materials and activities with regards to results of year 1 activities and state of PA and proposed changes to the law; and
3. Draft and submit proposed legislation for adoption based on the review and public.

Outcome(s): Comprehensive law review with recommended changes put into legislation;

Budget: \$75,000.00

VII. Fiscal and Technical Needs

A. Fiscal Needs:

CMP will conduct all tasks within the budget provided. Some work, such as mapping and inventory development, may be done by CMP to reduce overall costs.

B. Technical Needs:

At this point CMP believes it has most of the technical knowledge, skills, or equipment to carry out the proposed strategy. The exception may be in the area of conducting a survey of attitudes about the state of PA for the island. The acquisition of that technical expertise and skills is what portions of the budget will be utilized for.

VIII. Projects of Special Merit (Optional)

The Bureau's LUPP will work on mapping the PA sites inventorying the associated natural and cultural resources. This data and associated, with the exception of the exact locations of cultural resources, can be made available on the web for public as part of the public education and outreach efforts.

Task 2

Developing a Cumulative and Secondary Impact Policy for Guam

I. Issue Area(s)

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (*check all that apply*):

- | | |
|--|--|
| <input type="checkbox"/> Aquaculture | <input checked="" type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Energy & Government Facility Siting | <input type="checkbox"/> Wetlands |
| <input type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Marine Debris |
| <input type="checkbox"/> Ocean/Great Lakes Resources | <input type="checkbox"/> Public Access |
| <input type="checkbox"/> Special Area Management Planning | |

II. Program Change Description

A. The proposed strategy will result in, or implement, the following type(s) of program changes (*check all that apply*):

- ☐ A change to coastal zone boundaries;
- ☒ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;
- ☐ New or revised local coastal programs and implementing ordinances;
- ☐ New or revised coastal land acquisition, management, and restoration programs;
- ☐ New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
- ☒ New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management.

B. Describe the proposed program change(s) or activities to implement a previously achieved program change. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)

Due to the anticipated improvement in the local economy, increase tourist numbers and military build up, there is pressure on the local government agencies to move quickly to approve development projects without carefully considering the cumulative and secondary impacts to the environment and to the community. It is expected that by December 2010, the mitigation policy will be adopted for non federal government projects. The mitigation policy addressed

compensation for losses to the natural resources as a result of new development. Guam will be experiencing growth due to the military build up. This growth will have a tremendous impact on Guam's natural resources including fish, coral reefs, native forest, wetlands, mangroves, rivers, streams and the sole source aquifer.. The development of a CSI policy will assist the Government of Guam by having a better understanding of the cumulative loss of its valuable natural resources as a result of development.

The policy will assist the Government in fully understanding how a particular development will have on community and its resources. Guam does not have a requirement to assess the CSI from a proposed development.

The policy will determine the appropriate data needed to determine CSI. This effort will require that both local government agencies and federal agencies be engaged in this process. Although CSI issues are critical in determining impacts to development, very few government agencies are able to evaluate this appropriately. The policy will attempt to provide an analytical model that incorporates critical data appropriately addressing CSI issues. This strategy will assist the GCMP in developing methods to assess cumulative and secondary impacts and determine the extent of impact to natural resources. The policy will serve as a tool to engage the community in participating in land use planning and in determining the type of community they live in.

Due to the technical nature of this project, a Consultant with CSI experience will be sought. Members of the local and regional community with technical expertise will be invited to participate in developing the Scope of Work and reviewing of the proposals. The GCMP staff will assist in providing data and necessary coordination required for the completion of the project. An ad hoc committee composed of the GCMP, Department of Agriculture, Guam EPA, NOAA, and other Federal partners will be organized to review the CSI policy.

This project will assist the GCMP in formulating new legislation to address this new policy. The consultant will provide recommended language for the Government of Guam CSI law. The GCMP will work with stakeholders and members of the Guam Legislature to enact the new law.

III. Need(s) and Gap(s) Addressed

Identify what priority need the strategy addresses, and explain why the proposed program change or implementation activities are the most appropriate means to address the priority need. This discussion should reference the key findings of the Assessment and explain how the strategy addresses those findings.

IV. Benefit(s) to Coastal Management

Discuss the anticipated effect of the program change or implementation activities including

a clear articulation of the scope and value in improved coastal management and resource protection.

V. Likelihood of Success

Discuss the likelihood of attaining the proposed program change and implementation activities. The state or territory should address: 1) the nature and degree of support for pursuing the strategy and the proposed change; and, 2) the specific actions the state or territory will undertake to maintain or build future support for achieving and implementing the program change, including education and outreach activities.

VI. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps necessary for achieving the program change and/or implementing a previously achieved program change. The plan should identify significant projected milestones/outcomes, a schedule for completing the strategy, and budget estimates. If an activity will span two or more years, it can be combined into one entry (i.e., Years 2-3 rather than Year 2 and then Year 3). While the annual outcomes are a useful guide to ensure the strategy remains on track, OCRM recognizes that these benchmarks may change some over the course of the five-year strategy due to unforeseen circumstances. The same holds true for the annual budget estimates. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. Further detailing of annual tasks, budgets, benchmarks, and work products will be determined through the annual award negotiation process.

Activities	1st quarter	2nd quarter	3rd quarter	4th quarter	
Develop scope of work and RFP	X				
Select contractor and finalize contract	X				
Work with networking agencies and other stakeholders to determine CSI criteria		X			
Develop policy regarding parameters for CSI		X	X		
Develop CSI policy and craft language for mitigation law			X	X	

BUDGET

Object Class Categories	309 Funds	Other funds (306)	Total
Personnel			
Fringe Benefits			
Travel			
Equipment			
Supplies			
Contractual	\$70,000		
Other			
Total	\$70,000		\$70,000

Total Years: 1

Total Budget: \$70,000

Final Outcome(s) and Products: CSI policy to address impacts from the increase development including private, Government of Guam and DoD.

- Guidance that improves and strengthens the coastal planning processes to incorporate cumulative and secondary impacts when reviewing development project as stated in Executive Order 78-37.
- Guidance to address CSI impacts to support determination for loss of natural resources.
- Initiate the process of crafting new legislation to include CSI when analyzing on impacts to natural resources from both public and private property.
- Process for collaborating among relevant agencies for determining if a project will be sustainable.

VII. Fiscal and Technical Needs

A. Fiscal Needs: If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the applying agency has made, if any, to secure additional state funds from the legislature and/or other sources to support this strategy.

The GCMP will seek additional funds from Gum EPA and funds from the coral reef initiative.

B. Technical Needs: If the state does not possess the technical knowledge, skills, or equipment to carry out the proposed strategy, identify these needs. Provide a brief description of what efforts the applying agency has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).

It is expected that the GCMP will hire a consultant to develop the policy. The GCMP will conduct all the require public outreach to obtain public support for the CSI policy.

VIII. Projects of Special Merit (Optional)

If desired, briefly indicate what PSMs the CMP may wish to pursue to augment this strategy. Any activities that are necessary to achieve the program change or that the state intends to support with baseline funding should be included in the strategy above. The information in this section will not be used to evaluate or rank PSMs and is simply meant to provide the CMPs the option to provide additional information if they choose. PSM descriptions should be kept very brief (e.g., undertake benthic mapping to provide additional data for ocean management planning). Do not do provide detailed project descriptions that would be needed for the PSM competition.

Task 4

Green Government Building Pilot Project

Energy and Government Siting

I. Issue Area(s)

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (*check all that apply*):

- | | |
|---|---|
| <input type="checkbox"/> Aquaculture | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input checked="" type="checkbox"/> Energy & Government Facility Siting | <input type="checkbox"/> Wetlands |
| <input type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Marine Debris |
| <input type="checkbox"/> Ocean/Great Lakes Resources | <input type="checkbox"/> Public Access |
| <input type="checkbox"/> Special Area Management Planning | |

II. Program Change Description

A. The proposed strategy will result in, or implement, the following type(s) of program changes (*check all that apply*):

- ☐ A change to coastal zone boundaries;
- ☐ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;
- ☒ New or revised local coastal programs and implementing ordinances;
- ☐ New or revised coastal land acquisition, management, and restoration programs;
- ☐ New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management.

- B. Describe the proposed program change(s) or activities to implement a previously achieved program change. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)**

New building codes for Guam were recently implemented requiring new or improved building standards. This proposal anticipates to invoke interest, cooperation and participation by the residents of Guam to adopt more sustainable development practices that will enhance those existing procedures and long range planning processes for considering the needs of energy-related and government facilities and activities of greater than local significance.

Improve program policies and standards which affect the subject uses and activities so as to facilitate siting and redesigning while maintaining current levels of coastal resource protection.

III. Need(s) and Gap(s) Addressed

Identify what priority need the strategy addresses, and explain why the proposed program change or implementation activities are the most appropriate means to address the priority need. This discussion should reference the key findings of the Assessment and explain how the strategy addresses those findings.

The strategy addresses the need to adopt more sustainable development and energy efficiency practices. It will mitigate environmental impacts associated with population and development pressures, as well as provide significant benefits that will provide opportunities for energy savings, reduction of carbon emissions, increased property values, and the protection of Guam's natural resources. This strategy will raise awareness on sustainable development.

The GCMP does not have an enforceable policy that address energy and government siting, This project will address this gap.

IV. Benefit(s) to Coastal Management

Discuss the anticipated effect of the program change or implementation activities including a clear articulation of the scope and value in improved coastal management and resource protection.

As Guam's economy and population – and the associated pressures on coastal resources – grows, the need to adopt more sustainable development practices becomes more pressing. A movement towards clean, renewable energy, “smart growth” development practices, sustainable tourism practices, and other practices that promote long-term economic, cultural, and environmental integrity, would not only mitigate environmental impacts associated with population and development pressures, but would also provide significant benefits. Sustainable designs offer

opportunities for energy savings, reduction of carbon emissions, increased property values, and a healthy environment.

The Guam Coastal Management Program proposes a plan that will retrofit identified government of Guam-owned building(s) to be used as a pilot with a target of hitting a minimum level LEED (Leadership in Energy and Environmental Design) certification. The project will incorporate sustainable designs and improve site design practices in Guam for the protection of water quality, coral reefs and natural habitats. The goal of this project is to protect Guam's environment and engage government of Guam employees to become environmental stewards. We anticipate that by showcasing various government-owned buildings, it will inspire people to demand that these practices and designs are commonplace in Guam and will be reflected in policy, laws, procedures and codes without resistance.

The pilot project will incorporate sustainable practices that adapt designs typical for island conditions by using locally available materials and incorporating design flexibility for wet and dry season conditions. Sustainable design features are water conservation, energy efficiency, waste prevention; and indoor/outdoor environmental quality. For example, a waste prevention strategy will require that everything brought into a facility be recycled for reuse or recycled back into the environment through biodegradation. One way to do this is to use coffee mugs or refillable bottles instead of using styrofoams. Other green building retrofits may include permeable parking and walkways, rainwater harvesting, island bioretention, and rain gardens. These practices reduce stormwater runoff.

The project proposes to hire a consultant with technical knowledge in LEED. The consultant will be tasked to assess government-owned buildings in order to develop a priority listing of buildings that clearly have the potential of having adverse impacts to Guam's fragile environment such as hot spots or areas with potential hazards to employees or students. In the process, the consultant would produce a checklist to include items such as whether there are hazardous materials present, runoff issues, the potential thereof, its proximity to streams and river ways, presences of impervious surface surrounding the structure, and more. Furthermore, the consultant should provide a checklist of possible retrofits to become a sustainable development.

As an example, the General Services Agency (GSA) building, a hotspot, may be a candidate. Located on the rear of the building are various surveyed material such as metallic items and piles of old computers and accessories. Located on front of the building are used functional and broken vehicles on a large paved parking lot. There is a high potential for automotive fluids and other chemicals to be washed into roadside ditches during rain events and be carried to the bay.

Retrofitting Guam's public schools first before other government buildings might be another way to prioritize. By doing so, it will serve as an on-site lab for learning about runoff, the issues it presents and the consequences to the environment. Furthermore, the students can learn about alternative sources of energy such as harvesting the sun and wind and the use of energy efficient fixtures and appliances all in order to conserve our finite natural resources.

Our ultimate goal is to raise awareness on the advantages of green buildings, "alternative" development practices and innovative, efficient, economically-viable technologies. This will be accomplished through presentations or workshops to guide developers, engineers, contractors;

and consultants in the implementation of green retrofitting and possibly using the pilot building(s) to set by example. Additionally, building occupants (government of Guam employees/public school students) will be provided with a detailed walk-through of their green building, which will serve as an inspiration to those who wish to be better stewards of the environment. This project is an investment for the future with cost saving outcomes.

V. Likelihood of Success

Discuss the likelihood of attaining the proposed program change and implementation activities. The state or territory should address: 1) the nature and degree of support for pursuing the strategy and the proposed change; and, 2) the specific actions the state or territory will undertake to maintain or build future support for achieving and implementing the program change, including education and outreach activities.

We believe that the likelihood for success is realistic. People are scared of change, but through example, the possibility for public buy-in is achievable. By retrofitting government-owned buildings, public perception will be that we are all in this effort together. The government should not enforce regulations/requirements without abiding by them ourselves. The chances for public buy-in to sustainable development concepts and practices are greater if they can see the benefits. It is anticipated that green building designs and concepts will catch on to the extent that policy will reflect these trends.

VI. Strategy Work Plan

Activities	1st quarter	2nd quarter	3rd quarter	4th quarter	5th quarter	6th quarter	7th quarter	8th quarter
Develop scope of Work and RFP to hire a consultant with LEED qualifications	X							
Call a meeting of all Government Agencies/Departments to inform them of our proposal in order to gain public support.	X							
Develop Public Outreach and Education program to achieve government buy-in	X						X	
Creation of listing of government-owned buildings that have potential of having adverse impacts to Guam's environment (hot spots and areas of potential hazards)		X						

Creation of a priority list of government-owned buildings to be retrofitted.		X						
Hold a meeting with the government agencies/departments to discuss the feasibility of retrofitting the identified building			X	X				
Conduct a complete assessment of what the retrofit will entail as well as the cost.					X			
From the assessment, develop recommendations of changes and improvements to be presented to the Governor and Legislature for identified funding						X	X	

Enforceable Policies/Outcomes

- Creating and strengthening Guam's Zoning Law to enhance land uses that will define approved land use activities and guidelines for sustainable development.
- Advocate the need to implement the Guam Energy Building code.
- Enforcement energy building codes through the Guam Energy Task Force and the Department of Public Works.
- New policies and guidance required for all development to implement LEED design.
- Creation of coordinating body that assist in implementation of the Guam Energy Building Code.
- Work with Chamorro Land Trust Commission to promote energy building codes.
- Public awareness on the importance of building energy efficient building
- Implementation of green government building and public outreach
- Submit the program change once laws are adopted for improved energy efficient builds and government facilities

VII. Fiscal and Technical Needs

- A. Fiscal Needs:** If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the applying agency has made, if any, to secure additional state funds from the legislature and/or other sources to support this strategy.

The GCMP will partner with the Guam Energy Office and other appropriate entities to obtain additional funding for this project if required.

- B. Technical Needs:** If the state does not possess the technical knowledge, skills, or equipment to carry out the proposed strategy, identify these needs. Provide a brief description of what efforts the applying agency has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).

A consultant with specialty in LEED concepts will be hired to complete this project.

VIII. Projects of Special Merit (Optional)

If desired, briefly indicate what PSMs the CMP may wish to pursue to augment this strategy. Any activities that are necessary to achieve the program change or that the state intends to support with baseline funding should be included in the strategy above. The information in this section will not be used to evaluate or rank PSMs and is simply meant to provide the CMPs the option to provide additional information if they choose. PSM descriptions should be kept very brief (e.g., undertake benthic mapping to provide additional data for ocean management planning). Do not do provide detailed project descriptions that would be needed for the PSM competition.

BUDGET

Object Class Categories	309 Funds	Other funds (306)	Other sources	Total
Personnel				
Fringe Benefits				
Travel				
Equipment				
Supplies				
Contractual	\$150,000			
other				
Total				\$150,000

Task 4

TSUNAMI INUNDATION STUDY FOR SOUTHERN GUAM

I. Issue Area(s)

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (*check all that apply*):

- | | |
|--|---|
| <input type="checkbox"/> Aquaculture | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Energy & Government Facility Siting | <input type="checkbox"/> Wetlands |
| <input checked="" type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Marine Debris |
| <input type="checkbox"/> Ocean/Great Lakes Resources | <input type="checkbox"/> Public Access |
| <input type="checkbox"/> Special Area Management Planning | |

II. Program Change Description

A. The proposed strategy will result in, or implement, the following type(s) of program changes (*check all that apply*):

- ☐ A change to coastal zone boundaries;
- ☐ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;
- ☒ New or revised local coastal programs and implementing ordinances;
- ☐ New or revised coastal land acquisition, management, and restoration programs;
- ☐ New or revised Special Area Management Plans (SAMP) or plans for Areas of Particular Concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
- ☒ New or revised guidelines, procedures and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government and other agencies that will result in meaningful improvements in coastal resource management.

B. Describe the proposed program change(s) or activities to implement a previously achieved program change. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)

Coastal Hazards continue to be a priority area for the Guam Coastal Management Program (GCMP). Through past development practices, the results from this not only created in part by the human use of the land resulting in erosion along the shoreline but in particular due to the numerous typhoons and tropical storms our island has, and will continue to endure. In determining the coastal hazard assessment, we must take into account the nature and extent of human use of the shoreline on our island.

Tsunamis are just one of the things that influence coastal hazards. Recently, Tsunami Inundation studies utilizing the LIDAR data of the island acquired by the government of Guam were conducted by NOAA's Pacific Marine Environmental Laboratory. The studies targeted at three of the most populated areas on island. The program will pursue additional funding to select other less populated areas for study. For this strategy, GCMP will pursue a project on "Tsunami Inundation Study" for the southern area of Guam. The hope is that the current and future studies can be utilized in supporting efforts to change setback legislation.

III. Need(s) and Gap(s) Addressed

The implementation of a Tsunami Inundation Study on the southern area of Guam will enable better collaborative efforts among the technical expertise and government officials but also through our decision makers. The strategy for this project will enable setback legislation to identify what coastal areas are susceptible to surges, tsunami inundation and flooding and to support any proposed changes to land zoning and building permit laws and regulations for such areas.

IV. Benefit(s) to Coastal Management

The development of the Tsunami Inundation Study will lead to achieving goals and results from the study in the improvement of coastal and ocean resources management and protection.

V. Likelihood of Success

The degree of success for this project is high due to collaborative partnerships with the government agencies and to build on any existing data and/or studies.

VI. Strategy Work Plan

Total Years: One year

Total Budget: \$70,000

Final Outcome(s) and Products: A Tsunami Inundation Study for Southern Guam

Activities	1st quarter	2nd quarter	3rd quarter	4th quarter
Develop scope of Work and RFP to design public outreach program	X			
Select contractor and finalize contract		X		
Develop PSAs and other public outreach material				X
Collect baseline data		X		
Develop draft rules and regulations for implementation of the study			X	
Approval of final rules and regulations by				X

Attorney General				
Conduct stakeholder meetings on the final rules and regulations			X	X

BUDGET

Object Class Categories	309 Funds	Other funds (306)	Total
Personnel			
Fringe Benefits			
Travel			
Equipment			
Supplies			
Contractual	\$70,000		\$70,000

Enforceable Policies/Outcomes

- Report on alternative methods to improve and stabilize erosion along Guam's shoreline.
- Initiate the process to incorporate changes to Title 18 and 19 GCA and Executive Order 78-20, (Flood Hazard and Wetland Area Rules and Regulations) rules and regulations for development along Guam's Shoreline and within Guam's Seashore Reserve, Chapter 63, Title 21, Seashore Act (as amended) GCA .
- Revisions to the Building Code and Development Guidelines that requires incorporation of alternative methods to controlling erosion along the shoreline.
- Adoption of new building code enacted into Public Law 30-84 in February 2010 to reduce hazard damage across many categories.
- Information will assist in support of the development of the rules and regulations for the implementation of the New Seashore Reserve Plan for shoreline and hazardous areas.

VII. Fiscal and Technical Needs

A. Fiscal Needs: If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the applying agency has made, if any, to secure additional state funds from the legislature and/or other sources to support this strategy.

GCMP will conduct all tasks within the budget provided. Some work may be done by GCMP staff such as mapping and inventory development to reduce overall costs.

B. Technical Needs: If the state does not possess the technical knowledge, skills, or equipment to carry out the proposed strategy, identify these needs. Provide a brief description of what efforts the applying agency has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).

GCMP has some technical knowledge, skills or equipment to carry out some tasks of the proposed project. However, a contractor with expertise and skills will be hired from what is budgeted.

VIII. Projects of Special Merit (Optional)

If desired, briefly indicate what PSMs the CMP may wish to pursue to augment this strategy. Any activities that are necessary to achieve the program change or that the state intends to support with baseline funding should be included in the strategy above. The information in this section will not be used to evaluate or rank PSMs and is simply meant to provide the CMPs the option to provide additional information if they choose. PSM descriptions should be kept very brief (e.g., undertake benthic mapping to provide additional data for ocean management planning). Do not do provide detailed project descriptions that would be needed for the PSM competition.

5-Year Budget Summary by Strategy

At the end of the Strategy section, please include the following budget table summarizing your anticipated Section 309 expenses by strategy for each year.

Strategy Title	Year 1 Funding	Year 2 Funding	Year 3 Funding	Year 4 Funding	Year 5 Funding	Total Funding
Public Access for Guam's Natural and Cultural Resources Strategy	\$70,000	\$70,000				
Developing a Cumulative and Secondary Impact Policy for Guam		\$70,000				
Green Government Building Pilot Project			\$75,000	\$75,000		
Tsunami Inundation Study for Southern					\$70,000	
Total Funding						

